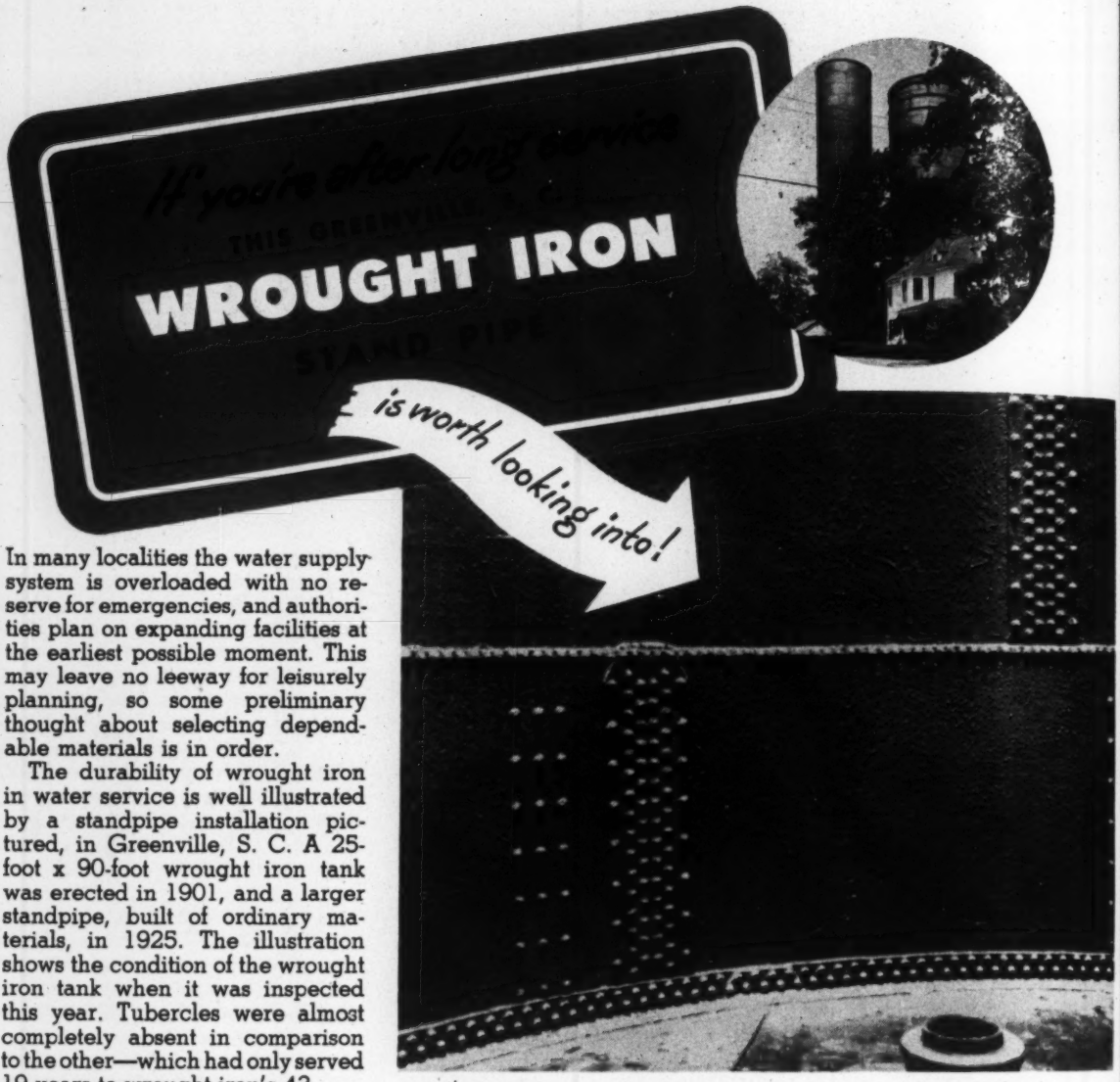
ENGINEERING NEWS-RECORD

SEPTEMBER 7, 1944

Water Supply Expansion in Wartime China

Scene of the Crossbow

Army Postal Service



In many localities the water supply system is overloaded with no reserve for emergencies, and authorities plan on expanding facilities at the earliest possible moment. This may leave no leeway for leisurely planning, so some preliminary thought about selecting dependable materials is in order.

The durability of wrought iron in water service is well illustrated by a standpipe installation pictured, in Greenville, S. C. A 25-foot x 90-foot wrought iron tank was erected in 1901, and a larger standpipe, built of ordinary materials, in 1925. The illustration shows the condition of the wrought iron tank when it was inspected this year. Tubercles were almost completely absent in comparison to the other—which had only served 19 years to wrought iron's 43.

This is by no means an isolated instance of long service. Houston, Texas, built a wrought iron standpipe 30-feet x 150-feet in 1885. When it was inspected not long ago, the engineers reported some slight corrosion at the top, but otherwise perfect condition . . . and that it "would be difficult to estimate how many more years it would last." Paducah, Ky. built a 22-foot x 175-foot wrought iron standpipe in 1886. The top 50 feet was removed in 1931, as high pressure and capacity were no longer needed . . . and the material was found in perfect condition. Provincetown, Mass., Greencastle, Ind., Vincennes, Ind., Conneaut, Ohio, Watertown, S. D., have all reported service records almost as impressive.

The corrosion resistance of wrought iron is easy to understand when you consider the unusual structure of the material. The main body is high purity iron, through which tiny fibers of glass-like silica slag are threaded. The network of fibers acts almost like a picket fence in halting and deflecting corrosive attack, and discourages the pitting and penetration that causes premature failure of ordinary materials. In addition, the fibers anchor the surface film that shields the underlying metal.

If you are planning or thinking about a tank, for municipal or industrial water supply, you will find some interesting and helpful information in our technical bulletin, "Wrought Iron for Tank Construction." We will be very glad to send you a copy; just write.

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ENGINEERING NEWS-RECORD

...ted to Buildings, Sewers, Waterworks, Bridges, Roads, Dams, Foundations, Earthwork, Flood Control, Public Works, Shipbuilding, Irrigation, Canals, Railroads

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WALDO G. BOWMAN, *Editor* ALBERT B. PAXTON, *Manager*

Vol. 133 SEPTEMBER 7, 1944 No. 10

COMING NEXT

• The northern road to Tokyo—a 2,000-mile stretch along the Alaska mainland and the Aleutian Islands is studded with airports that form vital stepping stones to the Nip homeland. How our engineers used steel plank over the barren arctic tundra for runway construction will be described by H. W. Richardson, *ENR* Western Editor, in the Sept. 21 issue.

• Another round has been won in the eternal battle to keep the Mississippi River within the confines of its levees. Army engineers have sunk 2,000 lin.ft. of articulated concrete mattress along the threatened bank of the Louisiana side. Despite high water and swift currents the job was completed in 20 days. The project will be featured in *ENR* for Sept. 21.

• Another example of North American engineering skills being applied to aid our South American neighbors is described in the story of "Chimbote: Potential Pittsburgh of Peru," scheduled for the Sept. 21 issue. Design and construction details are given of an industrialization project involving port works, coal, iron and steel development and the installation of a hydro plant, housing and sanitation facilities.

THINGS TO COME

• Righting of the 30,000-ton battleship Oklahoma, blasted and left in an almost upside down position by the Japs, at Pearl Harbor provides one of the most interesting engineering feats of the war in the Pacific. Through the use of a series of multiple cables rigged over high A-frames, compound pulleys and reduction gears, the big ship was pulled to an upright position by rotation. The operation will be described in an early issue.

• Concrete ships have proven effective for the war emergency gap they were designed to fill. Some 26 of these self-propelled craft have been produced under the current U. S. Maritime Commission program. They are the first vessels of this type to be built in the U. S., other than those constructed on an experimental basis, in 25 years. Thin concrete walls made from light weight aggregate, is a feature of the construction. Basic design information and description of the methods used will be published in an early issue.

	PAGE
News of the Week	85
Comment and Discussion	92
Editorials	94
The Saga of the Greenland Bases	96
How Tulsa Met a Water Supply Deadline	101
Enlarging the Intracoastal Waterway	106
Virginia's Postwar Projects — S. L. WILLIAMSON	110
Hydroelectric Plants in Brazil	111
Trains vs. Planes at Unusual Grade Crossing	111
"C/O Postmaster, New York" — T. H. CREIGHTON	112
Permit Fees Finance Wichita Street Repairs	115
Seven Hangars in Rigid-Frame Concrete Structure — H. J. SNITOFF	116
Milwaukee's Public Works Program	120
Arkansas Repairs Flood-Damaged Bridge	121
Water Treatment for Chlorophenol Tastes	122
Salt-Free Water for Wilmington	123
From Field and Office	127
Unit Prices	130
Material Prices	132
New Aids to the Constructor	140
Manufacturers' Activities	146
New Trade Publications	154
Men and Jobs	158
Construction Reports	217

Number of copies of this issue printed: 36,063

DO YOU WANT AN INDEX?

Due to the paper shortage, no index for the volume just completed, No. 132 (January-June, 1944) will be issued except to subscribers who ask for it. If you want a copy of the index please send in the coupon below. The index is now ready for distribution.

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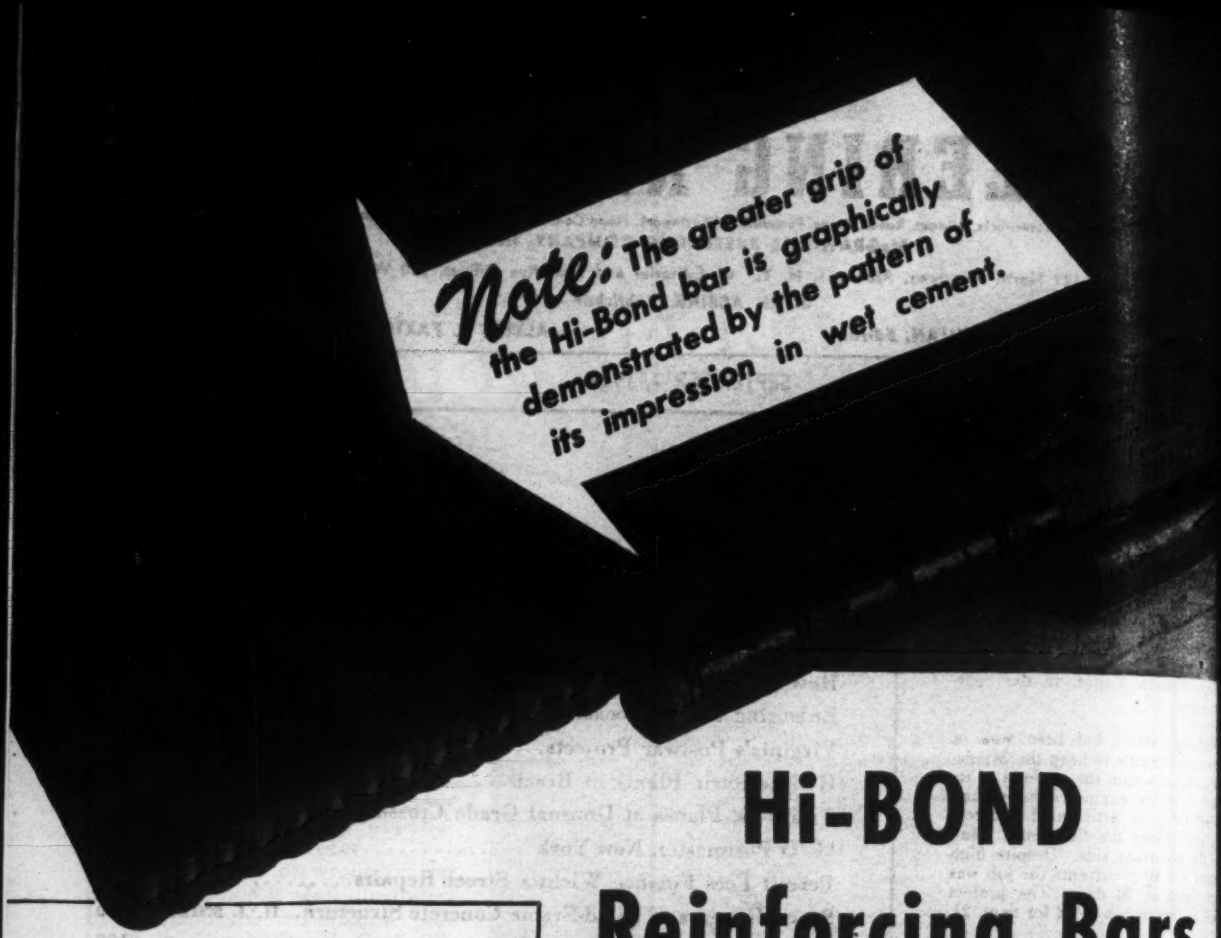

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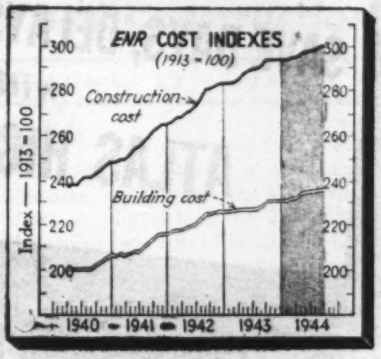
ONTHLY CONSTRUCTION BUSINESS SUMMARY

ENR CONSTRUCTION VOLUME AND NEW PRODUCTIVE CAPITAL

(000 omitted)	August 1943 (4 wk.)	August 1944 (5 wk.)	% Change†	Eight Months 1943 (34 wk.)	Eight Months 1944 (35 wk.)	% Change†
U. S. Construction	$161,548	$211,251	+5.0	$2,224,088	$1,261,642	−45.0
Construction	28,094	31,932	−9.0	283,282	271,706	−7.0
Construction	133,454	179,319	+8.0	1,940,806	989,936	−50.0
	118,103	146,190	−1.0	1,801,894	821,911	−56.0
New Productive Capital	$5,538	$43,861	+534.0	$2,926,726	$1,598,152	−47.0
Investment	5,538	42,531	+515.0	112,755	193,562	+67.0
(non-federal work)	.....	1,330	.....	160,133	140,790	−15.0
(federal work)	.....	.....	.....	2,653,838	1,263,800	−54.0
Construction Volume Index, = 100	119	121	+2.0	195*	104*	−47.0

†Adjusted for difference in number of weeks reported. * Eight-month average.



CONSTRUCTION COSTS . . . . WAGE RATES . . . . MATERIAL PRICES

	September 1943	September 1944	% Change	Changes August to September 1943 Aug.	1943 Sept.	1943 %	1944 Aug.	1944 Sept.	1944 %
Construction Cost = 100†	294.09	300.46	+2.2	291.38	294.09	+0.9	300.42	300.46	†
Building Cost Index, = 100†	231.20	236.00	+2.1	228.49	231.20	+1.2	236.09	236.00	†

† Does not reflect increased costs due to overtime, lower labor efficiency, delivery delays, etc.

ENR 20-CITIES' AVERAGE

Labor	$0.869	$0.883	+1.6	$0.869	$0.869	0	$0.882	$0.883	+0.1
Laber (Av. 3 trades)	1.622	1.640	+1.1	1.622	1.622	0	1.639	1.640	+0.1
layers	1.715	1.739	+1.4	1.715	1.715	0	1.739	1.739	0
tural Ironworkers	1.679	1.694	+0.9	1.679	1.679	0	1.694	1.694	0
nters	1.472	1.487	+1.0	1.472	1.472	0	1.484	1.487	+0.2
nt, per barrel	$2.61	$2.67	+2.3	$2.61	$2.61	0	$2.67	$2.67	0
forcing steel, cwt.	2.75	2.79	+1.5	2.75	2.75	0	2.79	2.79	0
ctural steel, base	2.10	2.10	0	2.10	2.10	0	2.10	2.10	0
, per ton	1.24	1.23	−0.8	1.21	1.24	+2.5	1.23	1.23	0
er, 2x4 Fir, per M ft.	53.20	54.58	+2.6	51.13	53.20	+4.0	54.58	54.58	0
er, 2x4 Pine, per M ft.	48.19	53.38	+10.8	45.28	48.19	+6.4	53.68	53.38	−0.6
common, per M	15.93	16.52	+3.7	15.68	15.93	+1.6	16.52	16.52	0
mixed concrete, c. y.	7.37	7.44	+1.0	7.37	7.37	0	7.44	7.44	0
clay tile, 3x12x12	79.34	80.48	+1.4	78.74	79.34	+0.8	80.48	80.48	0
asphalt, carn, ton	15.34	15.40	+0.4	15.27	15.34	+0.5	15.40	15.40	0

† Less than .05 percent change.

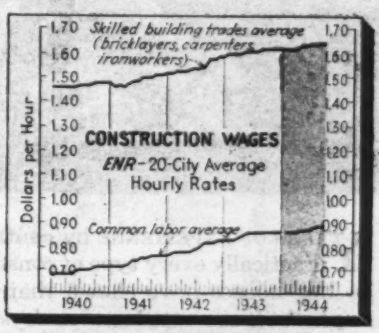
ENR INDEX NUMBERS

Base = 100	Construction Cost 1913	Construction Cost 1926	Building Cost 1913	Building Cost 1926	Volume '13	Volume '26
Sept., 1944	300.46	144.43	236.00	127.57	...	...
Aug., 1944	300.42	144.41	236.09	127.62	121	53
July, 1944	299.94	144.18	235.55	127.33	114	50
June, 1944	298.72	143.59	235.33	127.21	91	40
May, 1944	298.00	143.25	234.80	126.93	100	44
April, 1944	297.70	143.10	234.50	126.76	106	46
Mar., 1944	295.34	141.97	232.32	125.59	103	45
Feb., 1944	295.05	141.83	232.03	125.43	86	38
Jan., 1944	294.57	141.60	231.55	125.17	114	50
Dec., 1943	294.51	141.57	231.49	125.14	103	45
Nov., 1943	294.41	141.52	231.39	125.08	149	65
Oct., 1943	294.31	141.47	231.29	125.03	142	62
Sept. 1943	249.09	141.37	231.20	124.98	155	68
Aug., 1943	291.38	140.07	228.49	123.51	119	52
1943 (Av.)	289.95	139.38	228.75	123.66	176	77
1942 (Av.)	276.31	132.82	222.39	120.22	553	243
1941 (Av.)	257.84	123.95	211.46	114.32	375	164
1940 (Av.)	241.96	116.31	202.81	109.64	269	118

MATERIAL SHIPMENTS . . . . . BUILDING PERMITS

	August 1943	August 1944	% Change	July 1944	% Change July-Aug.
(% operating capacity) A. I. S. I.	98.7	96.2	−2.5	95.8	+0.4

	July 1943	July 1944	% Change	Seven Months 1943	Seven Months 1944	% Change
ated structural steel, tons, A. I. S. C.	56,843	33,994	−40.2	567,389	279,481	−50.8
t, thous. bbl., U. S. B. of M.	12,411	9,283	−25.0	77,349	51,117	−34.0
ing Permits, 215 cities, Dun & Brad-						
t (000 omitted)	$48,379	$72,003	+55.2	$277,110	$380,408	+37.3



COST OF LIVING INDEXES . . . . EMPLOYMENT

	July 1943	July 1944	% Change	June 1944	% Change June-July
of Living Index (N. I. C. B.)	103.1	105.0	+1.8	104.4	+0.6
(Housing) Index (N. I. C. B.)	90.8	90.9	+0.1	90.8	0
Employment (est.), thous., B. L. S.	39,921	38,607	−3.3	38,743	−0.4
tr. Employment (est.), thous., B. L. S.	1,222	678	−44.6	680	−0.3

ENGINEERING CONSTRUCTION CONTRACTS—ENGINEERING NEWS-RECORD—AUGUST, 1944

neering News-Record *reports continental U. S. Construction projects of the following minimum costs—waterworks, excavation, drainage and irrigation,* $15,000 *other public works,* $25,000; *industrial buildings,* $40,000; *other buildings,* $150,000

Five Weeks—Thousands of Dollars (000 Omitted)

	New England	Middle Atlantic	South	Mid West	West of Mississippi	Far West	United States August 1944	United States Eight Months 1944	United States Eight Months 1943	Canada
Works										
Waterworks	141	520	318	908	1,488	211	3,586	21,065	36,776	182
Sewerage	180	1,108	671	883	302	867	4,011	29,963	27,602	455
Bridges, public	.....	289	648	383	295	141	1,756	8,411	12,312	264
Earthwork and waterways	293	105	3,218	42	6,517	2,541	12,716	47,534	29,073	136
Streets and roads	385	2,681	4,428	8,355	6,977	2,158	24,984	145,008	173,809	1,610
Buildings, public	1,353	7,891	10,915	7,632	17,565	46,489	91,845	464,175	1,028,244	2,143
Unclassified, public	388	12,765	5,091	2,939	2,581	16,657	40,421	282,780	632,990	2,003
public	2,740	25,359	25,289	21,142	35,725	69,064	179,319	989,936	1,940,806	6,793
Federal government (included in above classifications)	2,116	20,143	20,003	10,184	26,750	66,994	146,190	821,911	1,801,894	.....
te										
Bridges, private	.....	32	.....	.....	.....	.....	32	1,357	3,031	.....
Industrial buildings	585	2,100	1,727	2,165	9,246	926	16,749	122,519	115,780	2,178
Commercial buildings	506	450	676	945	928	6,347	9,852	108,819	137,292	3,874
Unclassified, private	73	2,810	94	36	1,879	407	5,299	39,011	27,179	193
private	1,164	5,392	2,497	3,146	12,053	7,680	31,932	271,706	283,282	6,245
Engineering Construction:										
t, 1944 — 5 weeks	3,904	30,751	27,786	24,288	47,778	76,744	211,251	.....	.....	13,038
1944 — 4 weeks	4,705	28,940	28,434	20,442	25,063	50,977	158,561	.....	.....	13,845
t, 1943 — 4 weeks	11,819	21,553	37,277	17,510	36,767	36,622	161,548	.....	.....	12,958
Months — 1944	33,653	194,203	211,803	155,399	211,966	453,618	.....	1,261,642	.....	71,555
Months — 1943	105,490	279,322	521,887	260,241	512,627	544,521	.....	.....	2,224,088	84,053

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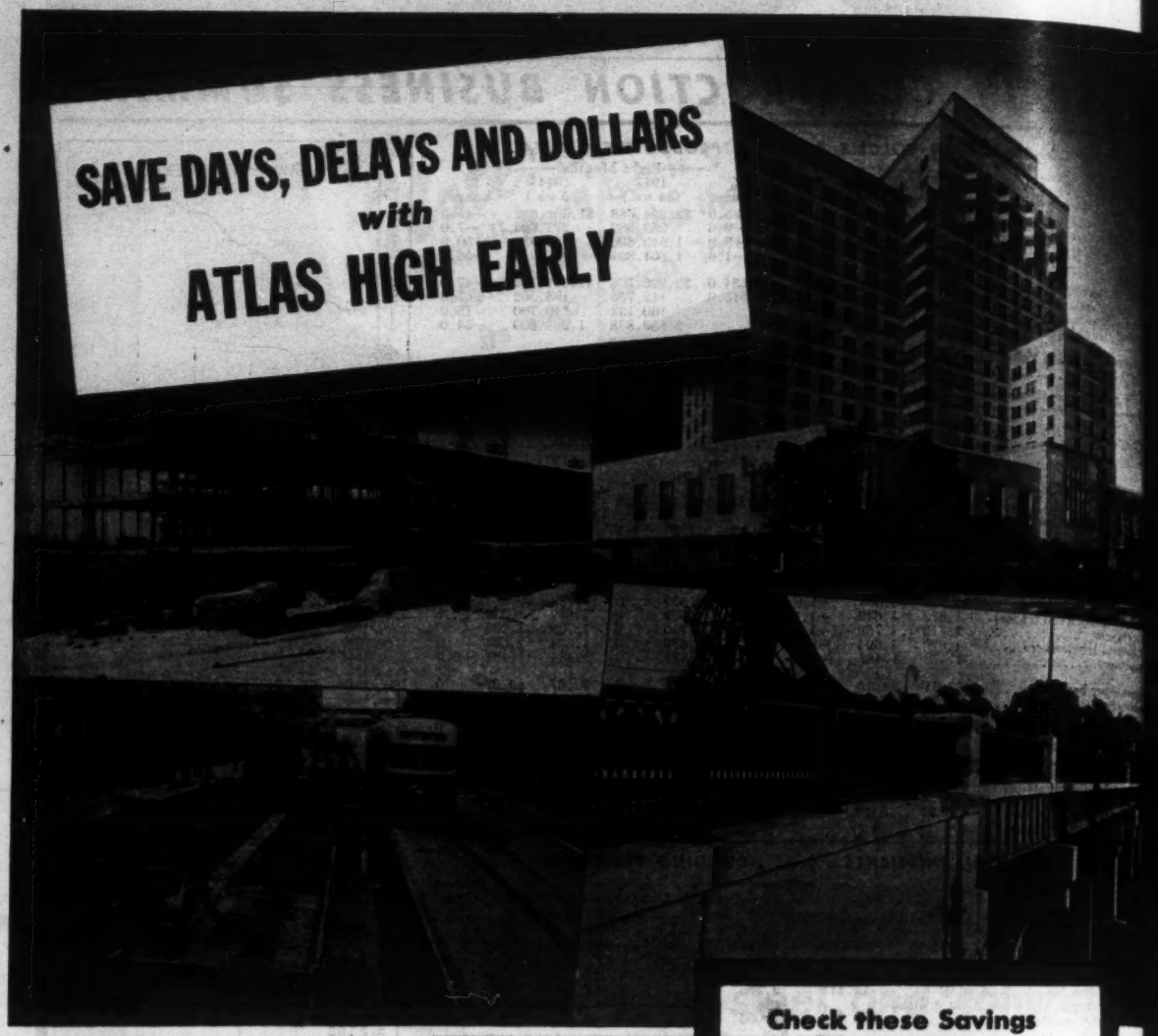

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5. **Reduces overhead** by saving time, manpower and equipment.

ENR-H-47

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The Week In Engineering and Construction

ENGINEERING NEWS-RECORD • SEPTEMBER 7, 1944 • VOLUME 133 • NUMBER 10

Three billion dollar program planned by Reclamation

Bureau of Reclamation also announces that remaining construction on 40 authorized projects totals $833 million; plans well advanced on nearly 200 other jobs.

Field studies, plans and specifications are rapidly being advanced by Bureau of Reclamation engineers for a $2,953,000,000 five-year construction program in seventeen western states, based on the price levels of 1940. Of this amount, $2,570,000,000 would be spent for actual construction, and the remainder for land, right-of-ways, preconstruction work, overhead, and other incidental charges.

A total of 236 projects to provide water for irrigating 6,705,000 acres of new land and supplemental water for 1,965,000 additional acres are planned. Power generating capacity to be installed is estimated at 4,200,000 kilowatts, including 2½ million kilowatts of firm power.

Of the 236 projects being planned, 40 developments, expected to cost over $833,000,000, have been authorized by Congress. As an accompanying table shows (see next page), some features of seventeen of these developments are already under construction, having been started before Pearl Harbor and continued as war-food or power projects. Included in this class are the Colorado-Big Thompson project, the Central Valley program, and added work at Grand Coulee Dam.

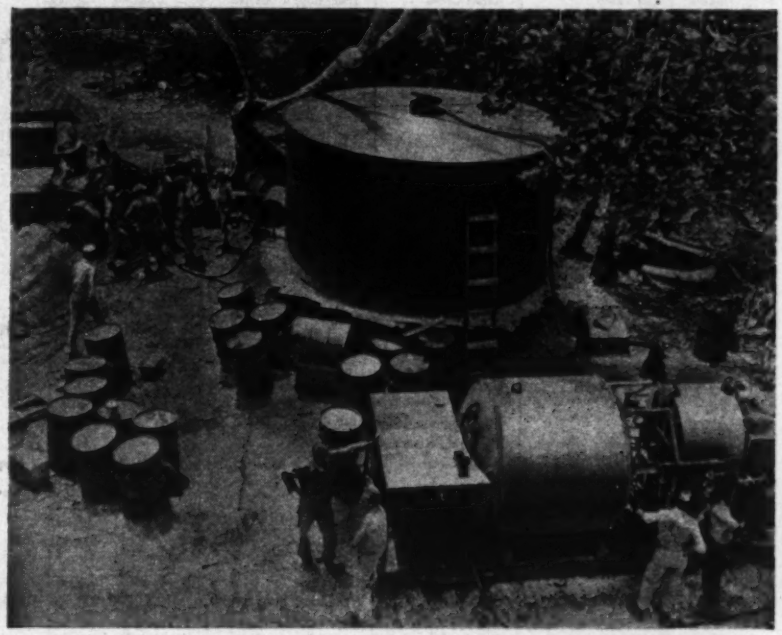
In addition, five projects totaling between six and seven million dollars were recently approved by the War Production Board and are just starting, as the table indicates, making a total of $185,000,000 of construction in progress. Somewhat over 2,200 men are employed by the contractors on the several jobs underway, and by the end of the present fiscal year somewhat less than one-fourth of this work will have been completed, reducing the $833,000,000 total of authorized construction by about $640,000,000.

Work on most of the remaining authorized projects could be started three months after funds for construction are made available and orders to proceed issued. Several jobs could be started in 30 days.

The 196 potential jobs, or those not yet authorized, vary in size from a $62,000 project to provide a new intake pumping station on the Yellowstone River in Montana to the 333 million dollar Colorado River-Phoenix diversion project, which would make Colorado River water available for irrigating 300,000 acres in Arizona, plus additional water for the city of Phoenix.

Plans for this large group of projects are in various stages of development, some having received only preliminary study, while others could be made ready for contract in a few weeks' time. Although personnel in the bureau's branch of design and construction at Denver

(*Continued on page* 87)



An Army "distillery" makes ocean water drinkable

Using the Pacific Ocean as a source of supply, Army engineer troops are shown here shortly after establishing a watering point on Island "X", with the aid of portable distillation equipment.

The distillation unit, shown in the foreground, is a self-contained double-effect evaporating mechanism employing an oil-fired boiler for the generation of steam. The entire unit is mounted on steel skids for easy mobility. Seawater is pumped from the ocean to the unit, which will produce a chemically pure water at the rate of about 5,000 gal. per day. For each gallon of fuel consumed the distillation unit will produce about 30 gal. of potable water.

At this particular installation the distilled water is collected in a steel storage tank (center) from which it is drawn as needed into small, trailer-mounted supply tanks (left background). The steel drums contain the fuel for the oil burner.

A new type of distillator, known as a thermo-compressor unit, is now available. This unit is more than five times as efficient as the double-effect evaporator. Both mechanisms were developed by the Cleaver-Brooks Co. of Milwaukee.

STATUS OF RECLAMATION PROJECTS AUTHORIZED BY CONGRESS

(Grand Total of Authorized Work $833,033,000)

Project	Stream	Principal purpose	Irrigation (acres)		Power installation, kilowatts	Principal structures	Total overall cost	Time requirement (months)	
			New lands	Supplemental water				To start construction	Complete construction
Construction now under way									
Arizona:									
Boulder Canyon	Colorado River	Power				Power			
Gila-Mesa unit	Colorado River	Irrigation	33,000			Canals, pumps	$3,580,000	3	
California:									
All-American Canal	Colorado River	Irrigation	400,000	20,000		Canals, pumps	31,817,000		
Central Valley	Sacramento River	Irrigation, power	50,000	124,000	300,000	Concrete dams, canals, pumps.	25,864,000		
Colorado:									
Colorado-Big Thompson	Colorado and South Platte Rivers	Irrigation, power		615,000	144,900	Dams, canals, power plants	38,939,000		
Mancos	San Juan River	Irrigation	2,000	8,000		Earth dam, canals	1,098,000		
Idaho: Anderson Ranch Dam	Boise River	Irrigation		340,000	30,000	Earth dam, power plant	5,154,000		
Montana: Fort Peck power	Missouri River	Power transmission				Transmission lines	1,000,000		
Nebraska: Mirage Flats	Niobrara River	Irrigation	12,000			Earth dam, canals	557,000		
New Mexico: Tucumcari	Canadian River	Irrigation, flood control	45,000			Earth dams, canals	5,525,000		
Oklahoma: Lugert-Altus	Red River	Irrigation, muni'l, flood control.	80,000			Masonry and earth dams, canals.	8,956,000		
Oregon: Deschutes	Deschutes River	Irrigation	50,000	8,000		Earth dams, canals	5,320,000		
Ore.-Calif.: Klamath-Modoc	Tule Lake	Irrigation	12,500			Dikes, pumping plant	410,000		
South Dakota: Rapid Valley	Rapid Creek	Irrigation, municipal	6,000	12,000		Earth dams, canals	1,650,000		
Utah: Provo River	Provo River	Irrigation, municipal		97,500	8,600	Earth dike, canals, pumps	9,975,000		
Washington:									
Columbia Basin	Columbia River	Power			332,000	Power plant	30,000,000		
Yakima	Yakima River	Irrigation, flood control, power.	102,310	4,000	20,000	Earth dam, power plant, canals, pumps.	15,400,000		
Subtotal			792,810	1,228,500	1,335,500		185,245,000		
Construction approved by W. P. B.									
Idaho: Rathdrum Prairie-Post Falls	Spokane River	Irrigation		3,500		Pumping plant, canals	300,000	1	
Montana:									
Bitterroot Valley-Woodside	Bitterroot River	Irrigation		18,600		Canals	1,070,000	1	
Dodson pumping	Milk River	Irrigation	1,655			Canals, pumps	62,000	1	
Fort Peck power	Missouri River	Power transmission				Transmission lines	5,200,000	3	
Intake pumping	Yellowstone River	Irrigation	580	260		Pumps, canals	62,000	1	
Subtotal			2,235	22,360			6,694,000		
Construction stopped or deferred									
Arizona: Davis Dam	Colorado River	Power, river regulation			225,000	Earth dam	41,200,000	1	
California:									
Central Valley	Sacramento and San Joaquin Rivers	Irrigation	500,000	1,426,000		Canals, pumping plants	142,013,000	2	
Kings River	Kings River	Irrigation, flood control, power.		800,000	146,500	Concrete and earth dams, power plant.	53,000,000	3	
Colorado:									
Paonia-Fire Mountain division	Gunnison River	Irrigation	2,000	12,800		Earth dam, canals	1,373,000	2	
San Luis Valley	Rio Grande	Irrigation		400,000		Concrete and earth dams	17,200,000	3	
Idaho:									
Mann Creek	Mann Creek	Irrigation	300	4,000		Earth dam	930,000	3	
Palisades	Snake River	Irrigation, flood control, power.		1,200,000	30,000	Earth dam, power plant	24,000,000	5	
Boise-Payette division	Payette River	Irrigation	27,000	25,000	10,000	Pumping plant, canals, dam	3,298,000	1	
Montana: Saco Divide	Milk River	Irrigation	9,400			Pumping plant, canals	692,000	6	
Montana: Hungry Horse-Kalispell	Flathead River	Irrigation, power	100,000			Concrete dam, power plant, canals	40,000,000		
North Dakota: Bismarck	Missouri River	Irrigation	4,875			Pumping plant, canals, drains.	310,000	3	
South Dakota: Angostura	Cheyenne River	Irrigation, flood control	16,180			Concrete dam, canals	5,160,000	3	
Texas: Valley gravity canal and storage	Rio Grande	Irrigation	165,000	550,000	18,000	Earth dams, canals	62,500,000	5	
Washington: Columbia Basin	Columbia River	Irrigation	1,000,000			Concrete and earth dams, canals, pumps.	240,000,000	1	
Wyoming:									
Eden	Sandy Creek	Irrigation	11,000	9,000		Earth dams, canals	1,817,000	1	
Kendrick	North Platte River	Irrigation	35,000			Canals	1,584,000	4	
Riverton	Wind River	Irrigation	68,000			Canals	4,118,000	4	
Shoshone-Heart Mountain	Shoshone River	Irrigation	41,000			Canals	1,902,000	3	
Subtotal			1,879,755	4,426,800	429,500		641,094,000		
Grand total, authorized construction			2,774,800	5,677,660	1,765,000		833,033,000		

$3,000,000,000 program

(Continued from page 85)

...e been hard hit by losses of key men ... military service and to private in... ...stry, about 500 workers are now em...yed in the chief engineer's office. Of ... number between 300 and 350 are ...fessional people, many of whom ...t spend their full time on projects ... progress, which is delaying the ad...cement of other plans. The largest ...ce employed in this office in peace-...e was between 1,000 and 1,200, and ...taff of 2,000 is considered necessary ...really push postwar designing.

Lack of funds delays planning

Another factor delaying the prepara...n of postwar plans is the lack of ...thorization for some jobs, several of ...hich will require special approval. ...ill a third factor is the limited amount ... funds available for field surveys and ...econstruction studies.

However, despite these limitations, it ... believed possible to have plans suffi...ently ready to permit 40 to 50 of the ...tential projects to be placed under ...nstruction in the first year after the ...r ends. Such a program would place ...re than $500,000,000 of work under...y in addition to that already author...d. Expressed in a different way, the ...tlook is so favorable that it now ap...ars possible to have a total of 150,000 ...n employed on reclamation construc...n sites one year after the postwar con...uction program starts.

How much construction is ready for immediate letting of contracts?

In case of a sudden end to the European war, precise data will be needed to appraise postwar construction prospects. Readers are asked to furnish information as indicated on the form below

As a reader of *Engineering News-Record* you can help us refute or confirm the widely held belief that even if materials were made available for civil construction next month or even by January 1, work could not go ahead because plans are not ready. Projects now available (completely planned, with financing arranged and site ready so that bids can be taken and field work can proceed promptly) are believed insufficient in number or volume to increase construction activity much over the present restricted rate.

We know that more than $12,000,000,000 of construction is proposed for "after the war" and that plans are "started or completed" on over $4,000,000,000 of this. We also know that a few contracts have been awarded for field work to start "as soon as priorities are lifted or materials are available". But we do not know how many projects, or the total volume of work they represent, are in the last two stages that count most, viz., (1) Plans complete ready for bids (financing and site available as well as plans) and (2) contract awarded (subject to availability of materials).

The volume of construction in these two stages is a measure of the readiness of the construction industry to get under way quickly once the signal is given.

By filling out the form below you can help greatly to expedite an accurate nation-wide appraisal of the construction industry's readiness to meet the new conditions that are expected with Germany's collapse. We shall greatly appreciate your cooperation.

Big housing program announced for Canada

Finance Minister J. L. Ilsley at Ottawa has announced provision of $275,000,000 for expenditure for housing in Canada, allocated as follows: $100,000,000 for loans to those building their own homes; $50,000,000 to lending institutions for construction of low rental homes; $20,000,000 for grants to municipalities to assist in clearing slum areas; $5,000,000 for loans in connection with new homes in rural areas; and $100,000,000 to guarantee loans for repairs to existing homes.

CONSTRUCTION READINESS SURVEY — PROJECTS READY FOR IMMEDIATE CONSTRUCTION

(Design Plans Complete—Financing Arranged—Site Available)

NAME & DESCRIPTION of project whose design is complete and for which financing and site are available:

.....

.....ESTIMATED COST $.....

LOCATION: State .....City ....County .....

OWNER: Name .....Address .....

ENGINEER or ARCHITECT in charge (Check which): Consult. Engr. ( ) Archt. ( ) Owner's Staff Engr. ( )

Name .....Address .....

CONTRACTOR (Show if contract has been awarded subject to available materials)

Name .....Address .....

...ate .....Sign: Name.....

Address .....

...ail to Business News Department, *Engineering News-Record*, 330 W. 42 St., New York 18, N. Y.

Cement ceiling prices advanced by OPA

An increase of 10c. a barrel in the manufacturers' and resellers' present ceiling prices for cement produced in the States of Ohio, Michigan, West Virginia, the western portion of Pennsylvania, the western tip of Virginia, and a portion of eastern Kentucky was announced recently by the Office of Price Administration. The increase, which became effective Aug. 30, applies to all types of portland cement except white cement, and includes masonry cement and other special types.

Previously, prices for cement produced in the defined area were limited to the cost to the purchaser for the same product for a delivery completed between March 1 and 15, 1942, adjusted only to reflect any actual change in transportation costs. The increase granted is determined to be the amount necessary to cover costs of that part of production needed to meet the estimated essential demand of 10,800,000 bbl. from the defined area during 1944.

The recent action also increases the prices of special cements, except white cement, in the northeastern states, comprising: Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, eastern Pennsylvania, Maryland, Delaware, District of Columbia, the city of Alexandria, Va., and five counties in northern Virginia. This latter increase amounts to 20 c. a barrel.

At the time prices were increased for portland cement sold in the northeastern area, the adjustment was not applied to special cements. Information furnished OPA demonstrated the need for a broadening of the action taken earlier.

. . .

Big oil companies plan foreign developments

The Standard Oil Co. of California and Texas Co. have joined in forming another company to direct important foreign exploration development operations, it was disclosed recently by Harry D. Collier, president of Standard, and W. S. S. Rodgers, president of Texaco.

American Eastern Petroleum Co., has been formed, with California and Texaco each owners of 50 percent of capital stock and assets.

It will direct exploration and development of properties in Egypt, New Zealand and Australia, as well as in the Netherland East Indies as soon as the latter is freed from Japanese domination.

Henry M. Waite dies; prominent civil engineer

Henry M. Waite, builder of the great union railroad terminal development at Cincinnati, died in Washington on Sept. 1 at the age of 75. At the time of his death Mr. Waite was a consultant to the Director of the Budget. Before World War I Mr. Waite was brought into national prominence by his success as city manager of Dayton, Ohio.

A native of Toledo, H. M. Waite graduated from Massachusetts Institute of Technology in 1890 and went immediately into railroad engineering work where he continued for twelve years. In 1909 he was named vice president and chief engineer of the Clinchfield Coal Corp. Ten years in that capacity was followed by two years as chief engineer of the department of public works of Cincinnati, where he largely reorganized the department and carried forward extensive studies of sewage disposal.

While serving in this capacity Mr. Waite was chosen as city manager of the reorganized city government of Dayton. His able handling of that relatively new form of city government won him national recognition.

In 1918 Mr. Waite resigned as city manager of Dayton to become deputy director of transportation on the staff of General Atterbury with the American Expeditionary Force. Subsequently he served in that capacity with the Second and Third Army, being advanced to the rank of colonel.

After the war Col. Waite went into contracting work at New York and later entered private engineering practice. In 1927 he was named chief engineer for the $40,000,000 trunk line railroad terminal redevelopment at Cincinnati which position he held until completion of the work in 1933.

In that year Col. Waite volunteered his services for work on the public works section under the National Recovery Act. Later he was named deputy administrator of the PWA.

U S Army Engineer photo

Chester Bridge steel cleared from river channel

Only 12 days were required to remove 500 tons of steel from the wrecked bridge over the Mississippi River at Chester, Ill., to provide a 300-ft. clear channel for vital war navigation. Swift currents, shifting sand and muddy water made salvage operations extremely dangerous and difficult. All submerged members of the 2-lane highway toll bridge, which was wrecked July 29 in a wild windstorm (ENR Aug. 3, 1944, vol. p. 125 and Aug. 10, 1944, vol. p. 138), were blown apart with heavy charges of 80 percent high-velocity gelatine dynamite placed around the truss joints; some joints required 325 lb. of explosive.

Demolished bridge sections were lifted clear of the water by the U. S. Army Engineers' 125-ton derrick, the "Hercules" (now to pier), burned into convenient lengths with oxygen-acetylene torches, loaded on two barges with a 12-ton capacity crawler crane (center), and towed to the river bank with a 250-hp. diesel-powered tow boat.

Contractor on the job was the Massman Construction Co. of Kansas City, Mo., original builders of the bridge. This initial removal of wreckage was done under the authority of Col. L. B. Feagin, U. S. District Engineer, St. Louis, as a necessity for uninterrupted river navigation, but removal of the remaining 1,800 ft. of bridge is the responsibility of its owner, the Chester Toll Bridge Commission.

News of the engineering schools

...ement C. Williams, who was presi... of Lehigh University from 1935 to ... 1944, has gone to Madison, Wis., ...re he will engage as consultant in ...neering and industrial education, ...g attention to departmental and ...utional surveys, to the develop... ...t of cooperative industrial re... ...ches and to the training of per... ...el in industry, with special refer... ...e to the postwar adjustments. Dr. ...iams went to the presidency of ...igh from the deanship of the College ...Engineering at the University of ...a. Previously he had been head of ...department of civil engineering at ...University of Illinois and at the ...versity of Kansas. He has served on ...mber of educational survey com... ...sions and on national committees ...tive to governmental administrative ...cedures. He has had practical con... ...s with industry as superintendent of ...struction, supervising engineer and ...consultant.

...President Franklyn B. Snyder, North... ...ern University, Chicago, announced ...tly that the Peter L. Simpson me... ...rial fellowship in the field of re... ...rch in the technological institute has ...n endowed with $20,000 by the Na... ...al Engineering Co. of Chicago. ...ce L. Simpson is president of the ...pany.

...President Snyder said part of the ...pson endowment would be used to ...e a study of mental ability tests and ...tional aptitude tests at various col... ...s and army camps. He will also ...e recommendations for tests he be... ...es usable at the college's technologi... ...institute.

...The board of regents of the Uni... ...ity of Michigan, Ann Arbor, recently ...approved the expenditure of more ...n $163,000 for research. Industrial ...ns have contracted for more than ...,000 in aircraft sulphur, nickel and ...ectograph research with the uni... ...sity's engineering college, bringing ...value of research work done by the ...ineering school since Pearl Harbor ...more than $1,000,000.

...Expansion of the University of Texas ...llege of Engineering to include two ...ditional buildings with 220,000 sq.ft. ...floor space, to meet an expected en... ...ment of 2,500 students a year by ...54, is advocated by Dean W. R. Wool... ...h, who says that enrollment of engi... ...ring students tripled between 1926 ...d the beginning of the war and that ...1,498 students there now include ...re than half the total male student body. Of the 1,498, there are 1,001 Navy trainees.

The dean also suggested that the engineering degree course be lengthened from 140 to 146 semester hours, which would make its study requirements only slightly under those for a master's degree.

Acting Dean L. L. Vaughan of the North Carolina State College School of Engineering at Raleigh, N. C., has announced plans for enlarging the school, and Ross Shumaker, the college architect, already has made designs for several new buildings to be constructed after the war.

Proposed buildings include a specialized engineering laboratory, a structure to house the engineering experiment station, and a mechanical engineering building. Additions to existing buildings to provide space for the ceramic, geological and industrial engineering departments also are included, as are plans for the addition of two floors to the civil engineering building to house the architectural engineering department.

Dean Vaughan said: "We anticipate a rearrangement of our curricula to place more emphasis upon fundamentals, and we may eliminate many one-term courses." In emphasizing the need for expanded facilities of the engineering school, he pointed out that engineering enrollment has increased from 600 in 1934 to 1,633 students in 1944, or 67.7 percent of the college's total enrollment.

Henry T. Heald, president of Illinois Institute of Technology, Chicago, has announced the appointment of Raymond Sauer, 1943 graduate of Illinois Tech, as a graduate assistant to teach civil engineering. He has been with the Dravo Corp., Pittsburgh, Pa.

Columbia University has expanded its guidance service for engineering students, it is announced by Dr. Nicholas Murray Butler, president. Nine members of the faculty representing six branches of engineering and three allied fields have been appointed to aid students in problems which arise during the 4-year period of training for engineering.

Students who have chosen a major field of engineering will receive continuing advice and guidance from these heads of departments: Prof. Arthur W. Hixson, chemical engineering; Prof. James Kip Finch, civil engineering; Prof. Walter A. Curry, electrical engineering; Prof. Walter Rautenstrauch, industrial engineering; Prof. Theodore Baumeister, mechanical engineering; and Prof. Thomas T. Read, mining and metallurgy.

The Texas A & M College is planning a new building to house a special engineering library available to all schools and registered engineers in the state.

A change in approach through teaching the courses of all seven basic branches of engineering as a co-ordinated group, with the first three years of each identical, and specialization coming in the fourth year, was proposed by E. G. Bailey, vice president in charge of engineering of the Babcock & Wilcox Co., in an address at the tenth annual conference of college and university trustees held at Lafayette College recently, and attended by representatives of about 100 institutions.

Speaking on "The Future in Engineering Education," Mr. Bailey emphasized "A great need for an engineering education which will train men to be general engineers, acquainted with the essence of all of the seven branches of fundamental engineering—mining, metallurgy, ceramics, civil, chemical, mechanical, and electrical—without too much specialization or too much generalization."

• • • •

Local governments want surplus war commodities

Sentiment in favor of time and price preferences for local governments in the disposal of surplus war commodities by the federal government is growing increasingly strong in local governmental circles according to the Municipal Finance Officers Assn.

Estimates are that by the end of the war, or earlier, the federal government will own war materials no longer needed for military purposes in amounts which range up to $150,000,000,000 in original cost.

This great surplus of materials and supplies contains many items which would be of great value to local governments—trucks, construction machinery, hospital and construction equipment, all conceivable kinds of hardware, vast quantities of material used in maintenance of buildings, cloth materials, dismantled buildings.

Because of this, officials of cities, counties and other units of local government are taking this stand: "Since these surpluses have been paid for by the taxpayers, the local units of government, which are supported by these same taxpayers, should receive preference in the disposal of these surpluses."

MEETINGS

National

AMERICAN PUBLIC WORKS ASSOCIATION, annual congress, Hotel St. Paul, St. Paul, Minn., Sept. 24-27.

INSTITUTE OF TRAFFIC ENGINEERS, 15th annual meeting, Sherman Hotel, Chicago, Ill., Oct. 1-4.

AMERICAN PUBLIC HEALTH ASSOCIATION, second wartime public health conference and 73rd annual business meeting, Hotel Pennsylvania, New York, N. Y., Oct. 3-5.

FEDERATION OF SEWAGE WORKS ASSOCIATION, annual meeting, William Penn Hotel, Pittsburgh, Pa., in conjunction with 17th annual conference of the PENNSYLVANIA SEWAGE WORKS ASSOCIATION, Oct. 12-14.

HIGHWAY RESEARCH BOARD, annual meeting, Netherlands Plaza Hotel, Cincinnati, Ohio, Nov. 22-25.

Regional and Local

NORTH DAKOTA WATER AND SEWAGE WORKS CONFERENCE, 16th annual convention, City Auditorium and World War Memorial Building, Bismark, N. D., Sept. 12-13; jointly with the NORTH DAKOTA LEAGUE OF MUNICIPALITIES.

NEW ENGLAND WATER WORKS ASSOCIATION, annual meeting, Poland Spring House, Poland Spring, Maine, Sept. 19-22.

ROCKY MOUNTAIN SECTION, AMERICAN WATER WORKS ASSOCIATION, annual conference Cosmopolitan Hotel, Denver, Colo., Sept. 21-22.

NORTH CAROLINA LEAGUE OF MUNICIPALITIES, 36th annual conference, Winston-Salem, N. C., Oct. 4-6.

GEORGIA WATER AND SEWAGE ASSOCIATION, 13th annual meeting, Atlanta Municipal Auditorium, Atlanta, Ga., Oct. 5-7.

SOUTHWEST SECTION, AMERICAN WATER WORKS ASSOCIATION, Stephen F. Austin and Driskill Hotels, Austin, Texas, Oct. 17-19.

Yellowstone River water compact is formulated

In anticipation of the allotment of waters of the Yellowstone River in the Missouri River basin, H. D. Comstock regional director of the Bureau of Reclamation at Billings, Mont., has been appointed to represent the United States on the Yellowstone River Compact Commission, it was announced recently.

Representatives of Montana, Wyoming and North Dakota will meet soon to agree on the distribution of waters from the Tongue and Powder rivers arising in Wyoming and Montana, tributaries of the Yellowstone, according to Bureau of Reclamation officials.

The federal government is represented in the formulation of the compact because of the constitutional requirement with respect to interstate agreements.

The Bureau of Reclamation is interested also because of its Lower Yellowstone project in Montana and North Dakota and because of its several proposed projects for further development of the Missouri River Basin.

Big Inch starts 2nd year with increased capacity

The Big Inch crude oil pipeline fro Longview, Tex., to the industrial are of Philadelphia and New York— stretch of 1,363 miles—recently bega the second year of its full length oper tion.

During its one year of operation has delivered 96,292,000 barrels crude oil produced in Texas to th eastern refineries. Designed to pum crude oil at the rate of 300,000 bb daily, it has consistently exceeded th rate.

JOBS OF THE WEEK

RUNWAYS, APRONS, etc. Mather Field, Calif.

A. Teichert & Son, Inc., Sacramento, Calif., has been awarded a contract t build extensions of runways, apron, taxiways, relocating drainage ditch, an night lighting system at Mather Field, by U. S. Engineers, Sacramento, $1,384,888. The field is being converted into an air transport school.

CHEMICAL PLANT, Front Royal, Va.

F. H. McGraw Co., Hartford, Conn., will build a plant to produce sulfuric ac for General Chemical Co., New York, N. Y. The cost will exceed $1,000,00 Defense Plant Corp. will finance.

ARSENAL, etc., Denver, Colo.

U. S. Engineers, Denver, awarded the contract for the conversion of Roc Mountain Arsenal and constructing 2 additional buildings, to Kershaw, Swine ton & Walberg, Rocky Mountain Arsenal, Denver, at $1,500,000.

PLANT, Richmond, Calif.

The Oronite Chemical Co., subsidiary of the Standard Oil Co., San Francisco awarded the contract for a plant to manufacture phthalic anhydride, basic stoc for paints and finishes, on a site adjacent to the Standard Oil refinery, t E. B. Badger & Sons Co., Boston, Mass., at $1,000,000.

NAVAL DOCK, North Vancouver, B. C.

British Columbia Bridge & Dredging Co., Ltd., Vancouver, B. C., has bee awarded a contract for constructing a naval dock, including dredging, th main store buildings, administration building, ordnance and engineering build ings, inflammable stores structure, boiler house, garage and guard house t cost about $1,500,000. Department Munitions and Supply, Ottawa, Ont., l the contract.

MANUFACTURING BUILDING, Hicksville, N. Y.

Glasfloss Corp., New York, N. Y., awarded a contract to design and construc a manufacturing plant to Austin Co., New York, N. Y. The estimated co is $2,500,000 and Defense Plant Corp. will finance.

STOREHOUSES, Clearfield, Utah

Bureau of Yards & Docks, Navy Department, Washington, D. C., let a co tract to build eight additional warehouses at Naval Supply Depot, to J. H Pomeroy & Co., Inc., Salt Lake City, at $3,038.701.

PLANT, Naugatuck, Conn.

Naugatuck Chemical Division, U. S. Rubber Co., Naugatuck, awarded a co tract for 2-story 40x100 ft. and 2-story 80x180 ft. plant buildings, road co struction and drainage to E & F Construction Co., Bridgeport, Conn. Th estimated cost is $700,000. Fletcher Thompson, Inc., Bridgeport, Conn. is th engineer.

PAVING AND SERVICES, El Toro, Calif.

Bureau of Yards & Docks, Navy Department, Washington, D. C., awarded contract for paving and services to Basich Brothers, Alhambra, at $885,000.

Note—Additional bidding and contract news on many projects large and small appear in the Construc News section beginning on page 217.

OBITUARY

...dney Wood Whitehead, 55, associ... professor of civil engineering in the ...artment of civil engineering at Penn...ania State College, and a member of ... faculty for 28 years, died recently. ... received his bachelor of science de... at Massachusetts Institute of Tech...gy in 1913 and master of science at ...th Dakota State College in 1917. He ... active in the Society for the Pro...tion of Engineering Education.

Charles H. Bolton, Jr., 33, of Tampa, ..., who was the assistant plant engi... of the Tampa Shipbuilding Co., ...d August 22 in Jacksonville.

William L. Plack, 90, engineer and ...hitect, died at Shipbottom, N. J., ...gust 26. He was a graduate of Lafay... College.

Mortimer E. Cooley, 89, dean of the ...iversity of Michigan College of Engi...ring from 1904 until 1928, died last ...k. An engineering authority of na...al repute, latterly he was dean emer... of the college.

...L. K. Stockwell, 62, civil engineer and ...el designer, died at Oakland, Calif., ... Aug. 24. From 1903 to 1906 he was ...ployed at designing steel plants for ... U. S. Steel Corp. at McKeesport, ... He went to Chile in 1912 as chief ...gineer for the Braden Copper Co., re...ining there five years. He joined ...bins Conveying Belt Co., Inc., in ...18. Later he was in London and ...anghai for the company, and at the ...e of his death he was in charge of ... Pacific Coast territory for Robins.

George E. Wycoff, 65, died at his ...me in Little Rock, Ark., Aug. 27. He ...nt to Little Rock to build the Little ...ck-Hot Springs highway and re...ined in Little Rock. At the time of ... death he was an assistant superin...dent of construction at the Arkansas ...dnance Plant, Jacksonville, and was ... charge of constructing asphalt roads ...ere.

H. F. Crippen, 42, chief draftsman ... the U. S. Engineers' office in Jack...ville, Fla., died Aug. 15 at his home ... Jacksonville.

George S. Donahue, assistant county ...gineer with the State Department of ...blic Works at Rochester, N. Y., for ...enty-five years, died Aug. 29. ... Born in Long Island City, he was ...duated from the Columbia University ...gineering School and worked as an ...gineer on the construction of the New York subways. Mr. Donahue had charge of the maintenance of all state roads in the eastern Monroe County.

Dennis P. Woods, former engineer for Whitman County, Wash., died Aug. 3 at Spokane, Wash.

Edward Brooks Simmons, 54, civil engineer, died Aug. 31 at Albany, N. Y. He served in the first world war as a major with the 302nd Engineers. In 1942 he was general superintendent for Foley Bros., Inc., and Spencer, White and Prentice, Inc., of New York on the construction of 200 miles of highways, docks and bridges in Iran. In 1943 he was in Brazil and in Nassau, on airports for the Royal Air Force as a U. S. government project.

CONTRACTS AND CAPITAL

CIVIL ENGINEERING construction volume in continental United States totals $211,251,000 for August, an average of $42,250,000 for each of the five weeks of the month, and the highest monthly volume reported during 1944. The weekly average volume, not including the construction by military engineers abroad, American contracts outside the country, and shipbuilding, tops the average for the four weeks of July, 1944 by 7 percent, and is 5 percent above the four-week August, 1943 average.

Public construction, on the weekly average basis, is 19 percent higher than in the preceding month, and is 8 percent above the 1943 month. Federal work gains 23 percent over last month, but is 1 percent lower than last year. State and municipal volume is 4 and 73 percent higher, respectively, than a month ago and a year ago.

Private construction decreases 33 percent from the July weekly average, and 9 percent from the August, 1943 average week.

The August volume brings 1944 construction to $1,261,642,000 for the eight months, a total 45 percent below the $2,224,088,000 reported for the period in 1943. Private construction for the year to date $271,706,000, is 7 percent lower than a year ago, and public construction, $989,936,000, is down 50 percent due to the 56 percent drop in federal work. State and municipal construction, $168,025,000, is 18 percent higher than in the period last year.

CONTRACTS

Continental U. S. Only (Thousands of Dollars)

	Week Ending Sept. 9 1943	Aug. 31 1944	Sept. 7 1944
Federal	$27,641	$46,911	$18,713
State & Municipal	2,266	6,104	3,823
Total public	$29,907	$53,015	$22,536
Total private	6,699	7,267	2,833
TOTAL	$36,606	$60,282	$25,369
Cumulative 1944 (36 weeks)			$1,287,011
1943 (36 weeks)			$2,322,368

Note: Minimum size projects included are: Waterworks and waterways projects, $25,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

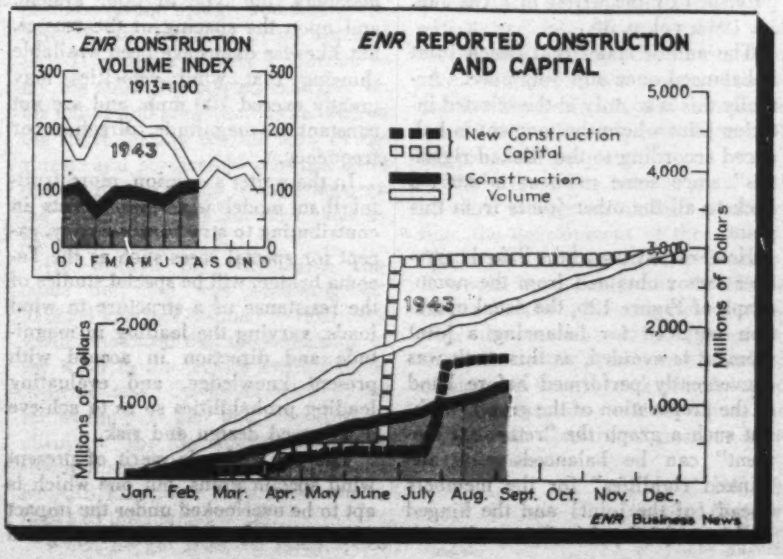
NEW PRODUCTIVE CAPITAL

Cumulative

	1943 36 Weeks	1944 36 Weeks
NON-FEDERAL	$275,317	$339,775
Corp. Securities	17,408	94,395
State & Mun.	97,776	104,590
RFC Loans	9,000	57,790
FPHA Loans	3,133	....
REA Loans	20,000	20,000
Fed.-Aid Hwy.	128,000	63,000
FEDERAL	$2,653,838	$1,263,800
TOTAL CAPITAL	$2,929,155	$1,603,575

ENR INDEX NUMBERS

Index base=100		1913	1926
Construction Cost	Sept. '44	300.46	144.43
Building Cost	Sept. '44	236.00	127.57
Volume	Aug. '44	121.	53.


ENR CONSTRUCTION VOLUME INDEX
1913=100
1943
D J F M A M J J A S O N D
ENR REPORTED CONSTRUCTION AND CAPITAL
New Construction Capital
Construction Volume
1943
Millions of Dollars
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
ENR Business News

Comment and Discussion

Readers' opinions on matters that concern engineers and contractors

Indeterminate Design

Sir—In "Moment Distribution by Linked Rigidities" by D. B. Steinman, (*ENR*, June 1, 1944, vol. p. 802), procedure shown for linking moments and carrying them over to a selected interior joint where they are balanced for final closure has certain advantages, particularly for those problems where all spans are loaded. Where symmetry and anti-symmetry are involved, the end rotation constant developed by Prof. Cross gives a direct solution, simpler than that shown for the three member symmetrical frame of Figure 17.

By use of the end rotation constant, the writer computes linkage factors in much the same manner as was shown in the article. The end rotation constant when multiplied by the span stiffness gives values that are identical to those found by "linked rigidities" developed by Dr. Steinman. For theoretically exact values it is necessary, of course, to link all spans or members, but as the effects of remote members are quite small, accurate results may be obtained without complete linkage. An article entitled "Bending Moments Distributed Directly By Utilizing End Rotation Constants" was published by the writer in *ENR*, Jan. 13, 1944, vol. p. 36.

The author states that "each joint is balanced once and only once." Actually this is so only at the selected interior joint where the moment is balanced according to the "linked rigidities" since some moment is carried back to all the other joints from this point.

However, by use of the linked carry-over factor obtained from the nomograph of Figure 12b, the usual operation required for balancing a joint moment is avoided, as this work was conveniently performed before hand in the preparation of the graph. Without such a graph the "returning moment" can be balanced using the "linked rigidities" for the members ahead (of the joint) and the hinged stiffness ($\frac{1}{4}$ I/L) for the member behind. Thus in the illustrated problem of Figure 16, the linked carry-over factor (.33) may be found from the ratio $\frac{0.5 \times 15}{7.5 + 15}$.

M. W. ROSENSTEIN,
Chicago, Ill.

The Chester Bridge Failure

Sir—Your editorial (*ENR*, Aug. 10, 1944, vol. p. 145), implying that what is needed to prevent failures of bridges due to wind pressure is model tests in a wind tunnel, appears to overlook the already large literature on the subject, including the excellent series of articles by W. Watters Pagon published in *Engineering News-Record* in 1934.

There has been no excuse for many years for any engineer to justify his wind load assumptions on the grounds that they provide for a uniform pressure of 0.0032 V^2 per sq. ft. acting on 1½ of the sectional area in elevation, with a wind velocity of 100 mph. Not only has it been known that the coefficient of this formula varies 100 percent or more from this value, dependent on the direction of the wind, the make-up of the individual members, the type of floor system, and upon the spacing of the trusses, but likewise data have been available showing that wind velocities may greatly exceed 100 mph. and are not constant in magnitude, direction, or frequency.

In the writer's opinion, more fruitful than model wind-tunnel tests in contributing to structural security, except for special cases such as the Tacoma bridge, will be special studies of the resistance of a structure to wind loads, varying the loading in magnitude and direction in accord with present knowledge, and evaluating loading probabilities so as to achieve a balanced design and risk.

The one and sole merit of present wind specifications, but one which is apt to be overlooked under the impact of a spectacular failure, is that, by and large, they have provided security against wind load failures, except in a very small number of cases. Public interest is best served not by having structures designed under specification such that a few failures cause less economic loss than would be the excess cost of providing absolute security for all. And the exceptional risk can be covered by insurance.

This basic engineering approach needs to be remembered not only in the field of bridge and building design, but in other fields. In recent years under the impact of active imaginations and technology, engineers have been apt to talk of providing for the absolute maximum flood or of providing absolute assurance against all risk. Life itself is filled with hazards and to attempt to make every structure stand on its own feet by prescribing extremely heavy loadings often defeats its own ends by eliminating the structure as a possibility. If an engineer, in presenting his cost estimates to his client, will frankly state that the exceptional is not provided for, and indicate the risk involved, then no one is fooled, and appropriate action can be taken.

S. P. WING,
Denver, Colo.

Graphic Design Methods

Sir: Both articles by D. B. Steinman ("Graphic Methods for Engineers," *ENR* May 4, 1944, vol. p. 658 and "Moment Distribution by Linked Rigidities," June 1, 1944 vol. p. 802) should be read by all structural engineers. Continuity in beams, girders and bents saves structural material, a fact which must be considered not only in the war emergency, but in post-war projects when a more serious competition will arise. One reason why the economical type of statically indeterminate structures has not been as widely used as it should be is that the anaysis is a rather complicated and time-consuming process.

The graphic methods presented by Dr. Steinman demonstrate how simply and quickly some typical cases of such structures may be analyzed. Another advantage of graphic and semi-graphic methods, that of clear visualization of the internal forces, which is necessary to avoid errors, should not be overlooked.

The writer has been interested dur-

the past twenty years in graphic semi-graphic solutions of statically indeterminate structures and has published many papers on the subject in European publications. Recently (1940-1944) some of his graphic methods were the subject of lectures given for practicing and consulting structural engineers in the University of California Extension Division. These methods are based on some properties of the ellipse of elasticity and have, incidentally, quite a similarity to Steinman's methods.

J. J. POLIVKA
Consulting Engineer
Berkeley, Calif.

Bridge Recollections

Sir: Your editorial on the Chester Bridge failure (ENR Aug. 10, 1944 p. 145) contains some interesting references to the almost forgotten Bridge accident of 1879. As it was one of the earliest of the major disasters of engineering history, a few more details may be of interest to present generation engineers.

The bridge, completed in 1877, crossed an inlet of the North Sea on the east coast of Scotland known as the Firth of Tay, a bottle-shaped estuary about 20 miles long and opening easterly. The structure was a little over 2 miles long and located about 6 miles from the mouth, in the neck of the inlet, and the contours of the land were such as to compress there the full force of easterly or northeasterly gales.

A lad in England at the time, I was vastly interested in the matter, and though I never saw the Board of Trade findings, I followed the testimony reported in the newspapers day by day. Just what actually happened to the bridge was never known. It had weathered the storm without harm until the night passenger train attempted to cross, as proved by the before watchmen's exchange of telegraph signals, but when the day broke it was seen that nearly a third of the bridge had gone.

The storm, by the testimony of oldtimers, was the wildest within memory, and the strength of the wind must have been far more terrible out at the neck of the estuary, where the bridge stood high above the water, than it was on shore. One theory was that the wind against the side of the train had buckled the track bracing, causing a sideways failure of the spans. Another was that the sway bracing of the high castiron towers carrying the bridge had failed under the extra wind load, and that towers and trusses had gone over together. An examination of the few pieces of wreckage within reach showed that some of the castiron lugs for attaching this bracing had been broken off. A third theory was that the train had been blown bodily off the rails, fouling the trusses and causing a general collapse of all adjacent trusses and towers. Perhaps all these causes were in action.

Of all the testimony which I now recall, that of one of the watchmen was the most detailed and graphic. He was on duty at the southern end of the bridge that night, and just before the passenger train was due from the south he had telegraphed the watchman at the north end and had received the "all clear" signal. The storm by then was at its height. When the train drew in and stopped to receive the signal, the engine driver got down and talked with the watchman about the safety of going on. He finally decided to risk it. The watchman saw the red tail-lights of the guard's van growing gradually fainter until they vanished in the murk. Half an hour went by, but no signal had come through that the train had cleared the bridge. The watchman then tried to contact the north end, but could get no reply.

As the minutes slowly passed he began to wonder if the train had been derailed on the bridge, and finally decided it was his duty to go out and see. It must have been a journey to try the soul. He started crawling on his hands and knees, but as he cleared the shore he met the full fury of the storm, and so terrible was the wind that he had to flatten himself between the rails and creep forward inch by inch.

He worked his way some distance out, but was becoming exhausted and had decided to turn back when he noticed that the screaming of the wind in the trusses seemed to be growing less. So he crawled on as far as the next pier and then stopped abruptly, for he found the track sheared across, and before him and beneath him were only black emptiness and the roaring wind.

When he got back he telegraphed his chief that the train was in the Firth. And there it has remained to this day, for the tides run strong and the water is deep. Where the train and its passengers found their last resting place no man knows.

A new bridge was completed in 1887, located about 60 feet upstream from the old one.

DAVID A. WATT
St. Petersburg, Fla.

The British Board of Trade had issued no requirements with respect to wind pressures up to the time of this accident but did so before the Greater Firth of Forth Bridge was built.—EDITORS.

Metric System for Airfields

Sir—The adoption of the metric system as a standard of measure in the United States has long been advocated by various groups and organizations. While the merits of the system are realized by most people, undoubtedly the greater objections to its adoption have been the expense and confusion in our economic system, which would be prevalent during the transitory period.

It is believed an extensive economic disturbance can be avoided if the metric system would be adopted as a standard in some particular field, and later extended to other vocations so there would be a gradual transition in the adoption of a new standard of measure.

There can be no better field to introduce such a proposal than airfield design. The development of air navigation and international trade, and the necessity for the United States to adopt an international system of measure in this field, will also contribute materially in the early introduction of the proposed project.

While there has been a great deal of work to date on airfield construction, the development of these facilities is still very much in its infancy. It would be a comparatively simple matter for the engineering profession, with the consent of Congress, to adopt the metric system as a standard of measure for all work pertaining to air transportation facilities before the anticipated accelerated postwar construction era.

JACK E. HOLLIS,
Associate Engineer,
U. S. Engineer Office,
Los Angeles

EDITORIALS

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How Many Plans Are Ready?

THE END OF THE FIGHTING IN EUROPE—and it can't be far off now—requires that a new yardstick be applied to postwar construction. No longer is it sufficient to know how much work is planned, and how much of that planned is actually being designed. Soon we will need to know what projects are advanced to the stage where work can begin, and what volume of work they represent in the aggregate. That is the new yardstick with which postwar planning must be measured. It is on that basis that *Engineering News-Record* reports of jobs are being compiled, starting this week. In the meantime, so that a quick picture of the status quo may be available, readers who are in a position to do so are asked to report by mail on projects that they know are ready to go. A simple form for the purpose is printed on page 87 of this issue. Our statistics show that some $12 billion of construction has been definitely proposed, and that for some $4 billion of this designs are "underway or complete". Should all of this work prove to be complete—designs and specifications finished and financing and necessary land available—there would be real cause for satisfaction. Filling out the form on page 87 and mailing it to this office will be of material help in evaluating the present outlook for construction.

Postwar Maintenance Manual

CONSTRUCTION EQUIPMENT manufacturers will find a valuable tip in the technical manual developed by the U. S. Engineers for the maintenance of overseas equipment. Similar manuals devoted to peacetime equipment maintenance would benefit manufacturer, distributor and contractor alike. When a machine breaks down, the contractor may be held up several days awaiting a service man from the factory or distributor to make a repair which could have been made on the spot had he known more about the equipment. Thus, the contractor suffers loss of operating revenue, the manufacturer is apt to have lost prestige with the contractor, and the distributor undoubtedly has lost some of his customer's good will. Manufacturers would do well to consider the advantages of better instruction manuals for their construction equipment, now that the Army has set an example. All service troubles will not, of course, be eliminated thereby but they will unquestionably be reduced.

Alaska Highway Prospects

THE ALASKA HIGHWAY again is in the news. This time the discussion is concerned with the highway's declining usefulness as a war facility. In August the 140-mile Haines Cutoff, built to reduce the load on the White Pass & Yukon Ry., was abandoned by the U. S. Army Engineers, and as a result fear is being expressed that the whole highway may be abandoned. This fear is not without foundation. Operating and maintenance costs are high, the highway is no longer needed to carry war supplies to Alaska now that the sea route is not subject to enemy attack, and once the flying of airplanes to Russia via the Alaska route becomes unnecessary there will be no urgent need for keeping the highway open to take supplies to the airfields it was built to serve. The present experience raises grave doubt as to whether the peacetime prospects for a highway to Alaska along any route are sufficiently good to warrant large expenditures by this country. And unless Canada shows more interest in such roads than she has to date, such prospects are definitely not worthwhile.

Doubtful Prefab Market Abroad

SOME HOUSE PREFABRICATORS in this country are said to be making plans to share in building the half million prefabricated homes that Prime Minister Churchill says will be needed in Great Britain to replace war-damaged homes. One can wish them luck, but at the same time harbor the suspicion that they are engaging in wishful thinking. After all, Mr. Churchill definitely said "*we* may make", meaning Britain. Moreover, it was a logical statement for the head of an industrial nation that must provide useful work for returning soldiers. Under the circumstances it would seem to be a waste of time for U. S. interests to count upon a market in Great Britain for our prefabricated houses. Moreover, Great Britain wants temporary housing while our need is for extension of prefabrication into the permanent-house field. This latter is the problem upon which prefabricators in this country should be expending their energy. In other words, they have knitting of their own to attend to.

ineers and the Invasion

TH THE INVASION OF EUROPE a matter of history the Battles of France and the Low Countries ually won, it becomes possible to assess the sig- cance of at least some of the engineering activi- that formed part of the tremendous military rations incident thereto. The activities began England two years before the invasion; they con- e to unfold as both American and British ies roll toward the Rhine through France, Bel- m, and Holland, constituting a record of which ineers everywhere can be proud.

s to the pre-invasion work, it has been amply onstrated how fundamentally important were airfields for our bombers and the depots for plies that the Engineers built in England. And that they can be talked about, equal import- e is seen to attach to such contributions as the ing of miles of waterfront in British ports, the rds" from which the landing craft were loaded; Assault Training Center where the beach attack ws were trained; the reconnaissance and map- g of 600 possible European landing beaches, luding the compiling of accurate tide tables for of them; and the preparation of designs for dge, railway and port construction in Europe a scale that approached virtual replacement of se facilities. Such "historic" activities are apt e overlooked, yet they were basic to the success the invasion.

And since D-day, Engineer accomplishments e continued to multiply. To begin with, the dings in Normandy were Engineer operations. the new Engineer Special Brigades, small self- tained armies that first secured the beaches then kept supplies moving across them, made pectacular success of their assigned job. Mili- commentators have pointed out that German tegy was based on the belief that we could break out of Normandy until we had captured put in operation some protected harbors and p water ports; that we could supply our neces- forces to the tune of 1,000 tons per division day over open beaches was considered an im- sibility. However, it proved otherwise, and, pite a storm that upset some of the carefully pared and elaborate plans, enough munitions e ashore to permit the British to hold the diffi- t Caen corner, and to enable the Americans to k through at St. Lo, and go on to conquer all of France. Now the British are repeating the process through the Low Countries.

German strategy also overlooked the ability of the Aviation Engineers to build landing strips and have them in operation in a matter of hours after the necessary terrain was cleared of the enemy. Many a battle situation in the early stages of the landings was saved by the fortuitous replenishment of supplies by airplanes using Engineer-built emergency landing fields.

What the Engineers did on the beaches and the airfields made it possible for the Battle of France to be won. What they did subsequently helped in the winning. Combat Engineers, for example, drove tankdozers through defended hedgerows, cleared lines and reduced pillboxes; as usual their activities were indispensable. Then the quick overrunning of Brittany and the drive to Paris and beyond by General Patton's motorized armor was put ahead of schedule by rapid Engineer bridging, steel treadway bridge companies and other special bridge-building units being in the vanguard of the advance. It is significant that none of the great river barriers of the last war in Northern France—the Marne, Meuse, Aisne or Somme—even slowed the attack. And this time we had to bridge the Seine.

Nor was bridge-building the only contribution that the Engineers made to the success of the mechanized armies. Indeed it was perhaps secondary to the building of pipelines that are bringing gasoline from tankers to distribution points far inland where thirsty tanks and other motor vehicles can be replenished to drive ahead.

From the time that the first demolition engineers laid the charges to blast the underwater obstacles from the paths of the landing craft, through the critical supply phase when we were holding onto our gains "by an eyelash", to the port repair operations at Cherbourg, Isigny and Caretan that the Germans had planned as bottlenecks to our advance, the Engineers were key factors in the invasion. They have retained their importance and added to their laurels as our forces have spread out into a war of movement. And when and if the Siegfried Line fortifications require another kind of engineering talent, that, too, can confidently be expected to be available and ready. There is justifiable pride these days on the home-front in the achievements of the engineers on the warfront.

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Fig. 1. Seagoing tanker barge gets emergency repairs in improvised drydock at a harbor serving a Greenland ba

The Saga of the Greenland Bases

***Editor's Note**—American contractors and U. S. Army engineer troops have built extensive facilities in Greenland for protection of our sea lanes and the east coast of North America. The contractors forces now are all back in the U. S. as are most of the Army engineer personnel. The story of the construction work presented here was told to Hal Hunt, associate editor of Engineering News-Record, by Col. G. W. Rathjens, Greenland District Engineer of the U. S. Corps of Engineers, J. M. Kellogg, project manager for the McWilliams Dredging Co. and Nick F. Helmers, Inc., and their staffs.*

IN GREENLAND it was as cold as 60 deg. below zero F., the wind had a velocity as high as 160 mph., the fjords sometimes were full of ice all summer so equipment could not be landed and "permafrost" had to have careful consideration in preparing sub-bases for runways and foundations for buildings. Despite this, the civilian and officer personnel of the Greenland district of the U. S. Engineers, associated civilian contractors and engineer troops built some major bases, a few auxiliary airfields and several weather stations in 27 months.

Work went on all year round, even where there was continuous night for weeks at a time. Fill material and drainage structures for runways were placed in the coldest weather but during the winter months work was concentrated on buildings to leave the three or four summer months for runway construction, particularly the surfacing.

Greenland is the largest island in the world, if Australia is classed as a continent. It is 1,600 miles long, some 500 miles wide and is relatively inaccessible except by water during the summer. It is almost completely covered with an ice cap. As a result, the longest road on the island is on some 13 miles, and it was built re cently by the U. S. Engineers. Th island is a Danish colony and ha been under U. S. protection sinc April 1941. Prior to U. S. occupatio the Germans had moved in to esta lish weather forecasting stations, th last of which was not eliminated unt the summer of 1943.

The contractors, McWilliam Dredging Co. (of New Orleans) an Nick F. Helmers, Inc., (of St. Pau first went to Greenland in Septemb of 1941. Plans for construction the prior to our entry into the war, we only a fraction of that actually bui Crews were signed up for a one ye contract. Most of the men, especial those going up in the spring o 1942, extended their contracts fo six months to work through a secon summer. Some of the employees stay more than two years.

Three-fourths of the work cre were recruited in the north centr states, particularly St. Paul and Sup

where the contractors had a sub-
ial following of experienced con-
ction men. Here also they could
w on loggers and the like who ordi-
ly worked outdoors through win-
only a little less severe than those
e areas where they were to work
Greenland. The men also were
to living in logging camps, away
their families through the win-
and consequently already were
ly acclimated to the work.

ven for these men, working on and
rozen ground and glacial ice has
a new experience and they have
rned from Greenland with new
ds that perhaps will become a com-
part of our technical terminology
the North Country is further
ed up. Most frequently heard is
rmafrost", which Col. G. W. Rath-
, Greenland District Engineer, and
ining and construction engineer
many years in the Far North, de-
as "permanently frozen material
arying depth existing above bed-
and below the zone of seasonal
." The colonel was particular to
nde bedrock, despite its being at
peratures below freezing.

olonel Rathjens defined another
ny of Greenland's work as storis
which is a flow of glacial origin
he fjords. Wind and water moves
ice around, sometimes in packs as
h as 30-miles long, all broken and
assable. Shifting storis ice may
harbors open at Christmas in
s 60 deg. weather and jam them
from July to October. Because of
blocking of harbors, supplies
into some of the isolated
her stations established on Green-
were planned for the possibility
ot being able to contact the men
ater or land for a period of as
as three years. Constant contact
intained by radio and emergency
lies are flown in and dropped
planes.

ere was one instance where a
slide crushed and buried the liv-
quarters of an isolated party in
of winter and it was necessary to
mergency materials in. Lumber
other building supplies were
up in bundles not more than six
ong and dropped from the bomb
of Liberator planes. Rather he-
measures, of course, but it re-
in saving the lives of the party
the weather opened up so that
cement material could be taken
other means.

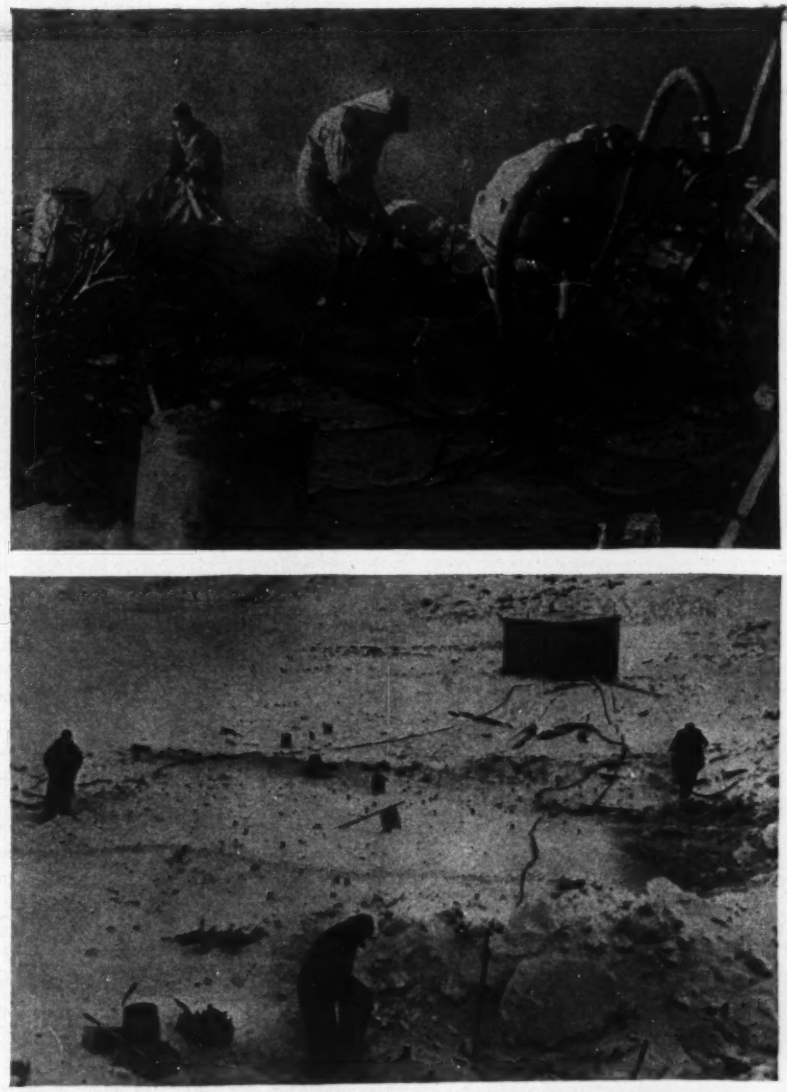


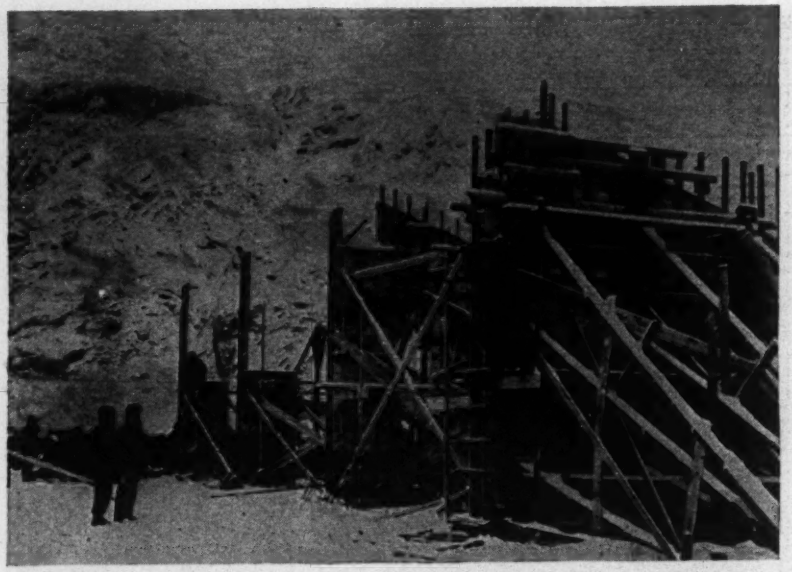
Fig. 2. Much of the time it was winter and there was considerable wind. Lower photo shows the end of a runway being extended along a mountainside. The shack houses air-compressors to protect them from the extreme weather.

All materials for construction and for living in Greenland, except sand and gravel aggregates, were shipped from the U. S. No trees grow in the regions where the bases have been constructed and air-command flyers even took spruces in from other points for the workmen to have Christmas trees. All food, except a few fish caught for recreation, was taken in.

Harbors are ice-bound several months of the year and originally were so shallow that freight had to be lightered up to wharves.

Large numbers of the best of all kinds of American construction machines were taken into Greenland when the work first started and more were sent as the magnitude of the project increased after we entered the war. Even dredges were taken to Greenland from this country and used in two of the harbors. Repair parts were slow in reaching the machines for which they were required, resulting in considerable borrowing, even "canabalizing" of machines, to keep others running.

Logistics thus proved to be a major part of the Greenland construction as it was necessary to transport so much to the construction site. Vessels with needed materials were sunk by enemy action, thus delaying,



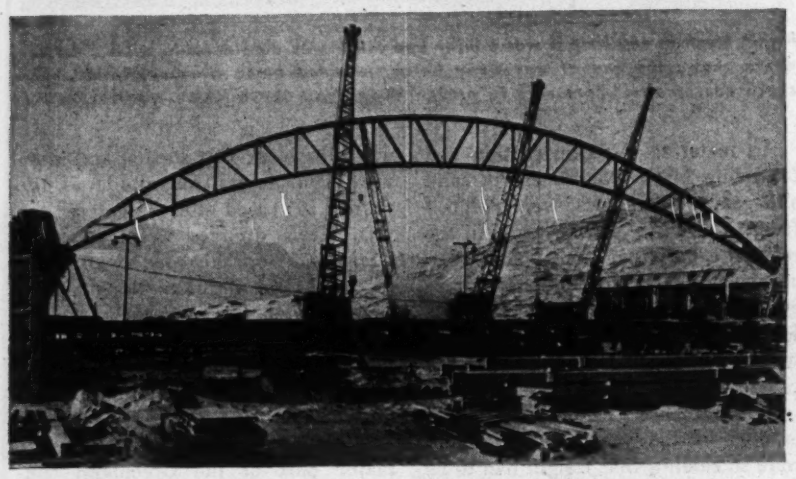


Fig. 3. Steps in construction of 160 ft. span hangar. Concrete was heated by ignition-type blast units and by steam, keeping the heat at 70 deg. for 48 hr. It was then allowed to cool gradually. Timber arches were preassembled and set in one piece by crawler cranes.

perhaps for an entire year, essential equipment and supplies as the summer season was too short to replace them in time to get into the Arctic ports.

All work was done by troops or civilian forces of the contractor from the United States. These forces learned quickly that it is possible to live and work in extremely cold climates. They lost only two days due to cold weather through two winters, despite temperatures as low as —60 deg. F. However, efficiency was admittedly low at temperatures less than —30 deg.

The secret of working in extreme cold, according to Colonel Rathjens, is always to keep dry. Clothing should be loose, in several layers and arranged so that it can be opened up or partly removed to prevent perspiration as dampness from body moisture is one of the greatest causes of freezing. Only small fires were permitted for warming hands or tools as larger fires were more apt to cause perspiration and subsequent difficulty.

Don't disturb permafrost

Size and location of the airports and many of the details of the bases are withheld for security reasons. However, most engineering features of them can be described.

Perhaps the most important lesson learned on construction operations in regions of permafrost is not to change the natural balance and flow of water, particularly in underground channels. In construction of runways, it is regular practice not to make cuts, using fills only to attain a level surface. Fills are made largely with gravel from glacial moraine, which acts as an insulating blanket to prevent deeper-than-usual thawing of the ground so that a normal "balance" is maintained. If deeper-than-previous thawing is permitted to occur, subsidence of the surface is almost certain to follow with subsequent difficulties in airport maintenance.

At one of the airports, below the Arctic Circle, where the temperature range is minus 10 to plus 60 deg. the facing is 6-in. thick unreinforced concrete laid in strips 25 ft. wide with the edges thickened to 12 in. A maximum daily rate of placing of 2,400 lin. ft. in 14 hours was attained. Two single-drum 34-E pavers followed by a transverse finisher, a powered longitudinal float and a joint machine were used. A dummy longitudinal joint was placed at the center of the 25-ft. strip

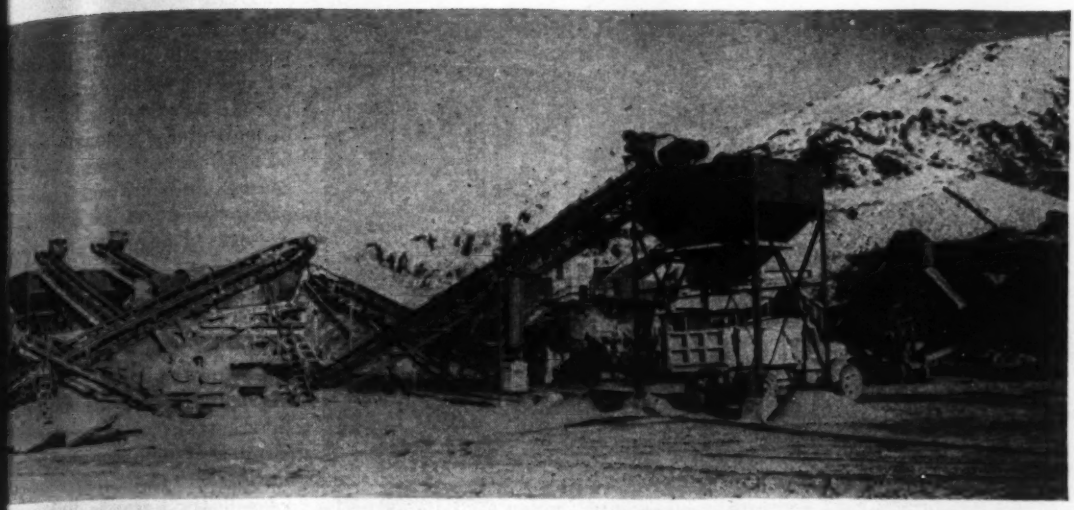


Fig. 4. American built crushing equipment was used to make runway material from glacial moraine.

nsverse dummy joints at 25 ft. Transverse contraction joints ced 100 ft. c. to c. filled with ick premolded asphalt joint. rly-strength cement was used of the concrete work at the nd bases, including the run-

nother area, the airport was an ancient fjord which had led with partly alluvial and wind-blown material that was o a depth of at least 200 ft. s were surfaced with asphalt, ual penetration and road-mix tion practices common to this but the materials had to be different. Naphtha, instead of , was used to cut back the Due to fogs and a high moisture of the air, and a short uitable for asphalt paving, it quite difficult to surface this o, it is hard to patch due to short periods when the weather is suitable.

At one of the major bases, over permafrost, a sand surfacing over selected gravel was used. The sand material is very fine and has no cohesion but sizes of material are such that it compacts readily. It has the characteristics of a clay, but unlike clay cannot be rolled between the hands into a cohesive string. Some moisture and generally low temperature, plus constant rolling of the clay-like material has prevented it from drying out so that it is blown badly by the wind. In the winter, of course, it freezes solidly and thus maintains an excellent surface.

Steel runway mats were used at first for emergency landings, but these have been replaced by paving, thus releasing the mats for use elsewhere.

Aggregate for concrete and asphalt surfacing and for building construction was produced on Greenland, with American-made crushing equipment, from excellent gravel existing in glacial moraines. At one location it was necessary to manufacture the sand also since water from the glaciers had washed out all of the fines in the moraine.

Snow removal on the bases in Greenland has been a problem comparable to that in the northeastern United States and Canada. Some of the airports have had little snow and others generally have been swept clean by the wind. However, considerable snow has had to be moved from some areas; handling methods and machines have followed practices similar to those used in continental U. S. Bulldozers, patrol graders and the like have had to be pressed into service due to shortage of specialized machines. On some fields where snow has been severe and removal equip-

g. 5. No eaves, hurricane bracing and double entry doors adapted army buildings to Greenland housing.

Fig. 6. All-timber hangar, erected from preassembled sections, shows extra bracing to protect against hurricane winds. Below is an all-steel hangar for which the main trusses were preassembled.

ment inadequate, compacting has been resorted to.

Structures at the bases were built of concrete, wood and steel, all of which had to be shipped from the "States." Buildings were designed for extreme winds, with hurricane bracing used to keep them from being blown away. Most of them were built without eaves, as the high velocity wind needed only a finger-hold under the roof to do a quick demolition job.

The men were housed in some Quonsett huts that had special entry ways built on them. Other temporary buildings were built similar to cantonment structures in the U. S. but these also had storm entrances added. Insulating fiber board was used for interior finish of the habitated structures. Mineral wool bats were used in the hospital building to assure a more even temperature.

Building construction over permafrost had special problems. It was found necessary to keep the footings of buildings and other excavation above the depth to which ground thaws in the summertime, exactly the reverse of what engineers normally would think the proper procedure. The reason for keeping the footings above permafrost is that the water normally flows down along the line between the foundation structure or replaced fill and the undisturbed earth. This has a tendency to th perhaps only slightly, the frozen terial along the contact line. Since permafrost contains a high percent of moisture, occasionally as much 50 to 60 percent, even a little thaw causes subsidence and it becomes gressively worse as wider chan are opened up.

Preferred construction is to b above the ground and to use th gravel blankets below foundation spread the load. An open space no left below the building floor to per air to circulate under the building that heat is not transmitted to ground. Double flooring is used ceiling is added under the joist keep floors warm in living quart

Concrete for the buildings heated by airplane-engine preha of the ignition type with an outpu 550,000 B.t.u. per hour, supplemen by live steam from oil-fired boi The two types of heating plants erally were used together as the st supplied moisture to counteract drying caused by ignition type h ing.

Concrete abutments for an truss hangar with a span of about ft. were built during the winter shown in Fig. 3. Tarpaulins cove the concrete, which was placed at peratures above 70 deg., attained heating aggregate with perfor steam lines laid under the aggre piles and by warming the water. crete all was made with high-e strength cement and after placing maintained at 70 deg. temperature 48 hours, and then allowed to gradually. An all-timber hangar at one of the bases and a steel-fr hangar are shown in Fig. 6.

In general, construction in Gr land was similar to that in the n ern part of the U. S. and Canada cept for the foundations. The cold son was generally longer. For activities, conventional methods winter building were adequate were used.

All of the contractors forces are out of Greenland but U. S. E neer troops remain to maintain, pair and do some extension of f ties. The latter still are faced difficulties in maintaining a ance" of frozen depth in the pe frost region as here even a chan a surface-water course may c thawing below the ground that sults in subsidence.

How Tulsa Met a Water Supply Deadline

***Contents in Brief**—Despite priority problems and other handicaps to construction, Tulsa, Okla., completed a major expansion of its water supply in time to cope with industrial and summer peak demands. Filtration facilities were enlarged, pumps were added and the distribution system extended to serve major war plants.*

GOOD DRINKING WATER is a precious commodity. This is held to be particularly true in Tulsa, Okla., where far-sighted planning, quick action and persevering efforts on the part of its waterworks engineers have enabled that city to furnish all the water needed for war-born industries and a substantially increased population.

To do this it was necessary to enlarge the existing filtration plant by 67 percent, add two new high-pressure pumps and install several miles of large water mains. Despite shortages of critical materials and priority problems encountered on municipal construction during wartime, the expanded system was completed in time to cope with this year's summertime peak demand for water.

The old filtration plant, built in 1928, had a capacity of 24-mgd. continuous demand and would provide 36 mgd. at peak load. It had two circulatory mixing chambers set flush with the ground, two coagulation basins, and six 4-mg. rapid sand filter basins. Mixing chambers and coagulation basins set a short distance from the filter building. Increasing the plant's capacity called for one new mixing chamber, one additional coagulation basin and an extension to the filter building to house four new 4-mg. rapid sand filters. The new plant has a 40-mgd. continuous capacity, capable of filtering 60 mgd. at peak load.

High pressure pumps added

No additional low lift pumps were needed since the three existing 12-mgd. variable speed pumps are used chiefly to increase the head of raw water flow through the plant and to pump additional water from two storage lakes nearby during summertime peak demands. The city gets its water from Spavinaw Lake located some 60 mi. northeast of the city. The water is brought down from Spavinaw Dam through 28 mi. of 60-in. reinforced concrete conduit, through a 9,200-ft., 84-in. horse-shoe shaped tunnel under Tiawah Ridge and then through 24½ mi. of 54-in. concrete conduit to the filtration plant.

Tulsa is fortunate in that its raw water is of a very good quality, requiring relatively little chemical treatment with chlorine, alum and lime. Not more than $10,000 a year is spent on the purchase of chemicals to treat the water supply for 200,000 citizens.

The three existing 12-mgd. high pressure pumps have been supplemented by a new 20-mgd. steam driven turbine high pressure pump installed in the old pumphouse, and one second-hand electric pump purchased from the city of San Francisco having a 15-mgd. capacity against a 350-ft. head. The addition of these two pumps not only insure sufficient pumpage into the city's distribution system but they also furnish extra standby capacity for emergency.

Influent lines had settled

When the original filtration plant was built, the designing engineers realized that eventually, the capacity would need to be increased. Consequently, when the two 54-in. dia. cast iron influent lines were installed in the filter building an additional 68-ft. length of each pipe was extended through the south wall of the building and buried just below ground level to permit future plant extension without interrupting service.

But this provision created difficulties when the filter building was enlarged. Although the design theory was essentially correct it did not work out satisfactorily in practice. Due to inaccuracies in construction and settlement over a period of years the projecting lengths of pipe were considerably out of line, both vertically and horizontally.

The first problem, then, in enlarging the filter building was to com-

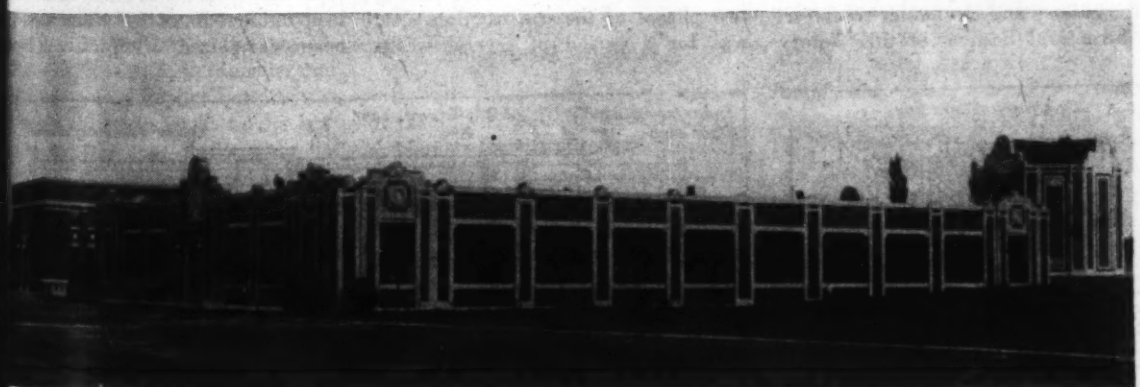


Fig. 1. Additional filters, mixing chamber and coagulation basin facilities form part of the improvements to Tulsa's treatment plant. It is difficult to distinguish between the old and new construction.

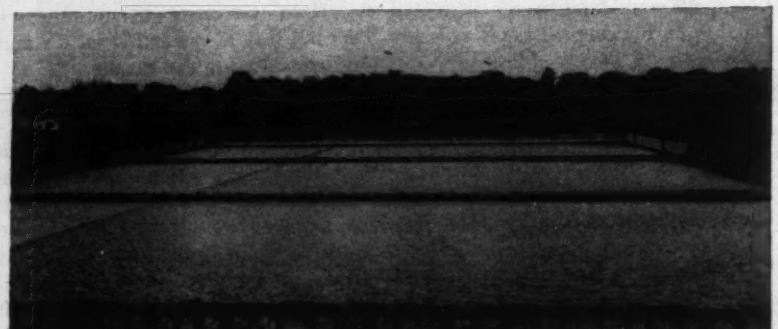


Fig. 2. Designs for the new mixing chamber (top) and the new coagulation basin, at far end, (bottom) were duplications of existing units.

pletely relay the 68 ft. of exposed twin lines of influent pipe and to substitute certain sections of pipe to fit the requirements of the new filters and piping. After this was accomplished (which incidentally necessitated shutting down the filtration plant for 24 hr. and treating the city's water with chlorine only), the other vexatious problem was to support the heavy pipe while excavating for the filter beds, pipe gallery and clearwater reservoir.

Structural designs of this 3-story building extension called for a set of filter beds to be built on each side of the existing influent lines. Immediately below these lines in the pipe gallery are the washwater lines, the effluent line leading to the clearwater reservoirs, and the sewer drain. The reservoirs are directly beneath the filter beds. (Fig. 4).

It was necessary to support the two 54-in. castiron influent lines during two phases of the construction. One was for a period of several weeks while excavation immediately adjacent to and outside of the lines was carried down to the bottom of the clearwater reservoirs, located 26½ ft. below the top of pipe. The bottom slab, outside walls and interior concrete walls on each side of the pipe gallery were also poured during this interval. The second phase included excavation and concrete work for the pipe gallery located immediately below the influent lines.

Timber bents support pipe

After the projecting 68-ft. lengths of influent lines had been re-laid to correct grade and alignment and supported on temporary concrete saddles, timber bents were placed 12 ft. apart on concrete footings founded in firm shale to support the steel I-beams which carried the influent lines while the clearwater wells were being constructed. Limited clearance required the bents to be placed between the two 54-in. lines, which are spaced 16 ft. c. to c. (Fig. 3). Each of these 6 bents were securely braced both transversely and longitudinally to prevent any movement which might cause undue strain on the influent pipe.

Transverse bracing included one cross-brace of 2x12-in. timbers and two 2x12's near the tops of the 10x10-in. vertical posts. Longitudinally, the bents were cross-braced in pairs with 2x12-in. timbers while two continuous 2x12's held the tops of each line of posts. Each post was anchored with a ¾-in. driftpin to a 3-ft. x 3-ft. x 15-in. concrete footing. The two posts forming a bent were spaced 9 ft. c. to c. Footings were poured in firm shale and anchored with four ¾-in. steel rods grouted 7 ft. into the shale.

All bents were erected with their tops slightly above the tops of the cast iron influent lines. An 18-in. steel I-beam was placed on top of each bent

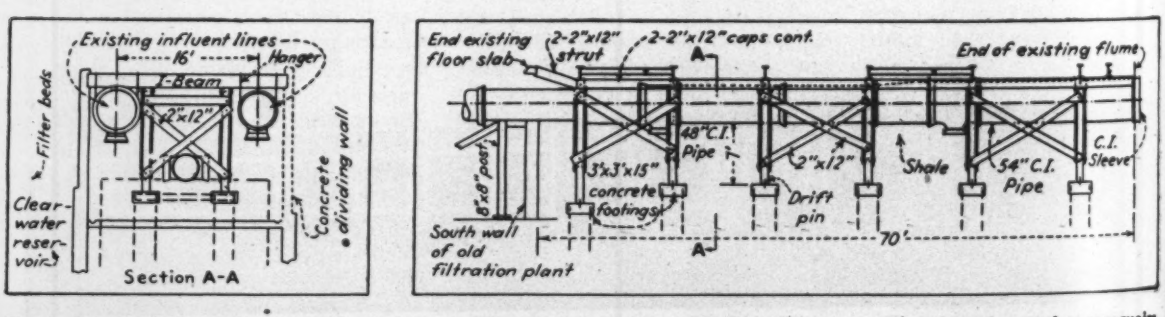


Fig. 3. Existing influent lines were hung from cantilevered steel beams (left) while excavating for clearwater reservoirs. All six timber bents supporting the 68-ft. projection of twin influent lines (right) were securely braced to hold the pipes in correct alignment. Influent lines are of 48-in. diameter.

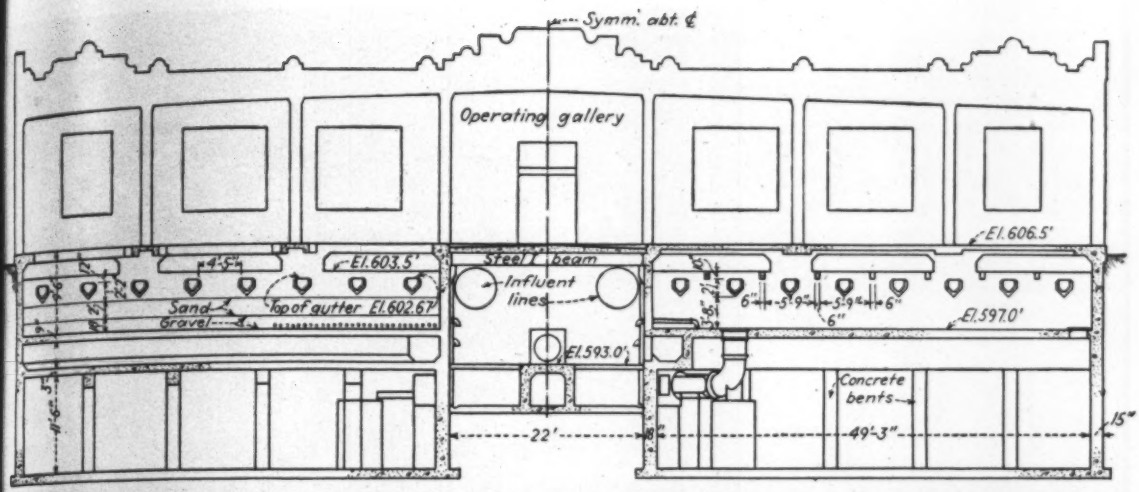


Fig. 4. Clearwater reservoirs are located beneath the new filter beds and on either side of the pipe gallery in the filter plant extension. Immediately below the influent lines are the washwater lines, the effluent line and the sewer drain.

and cantilevered out over the influent pipes, which were then held in correct position and alignment by steel pipe hangers attached to the steel beams.

With the influent lines carefully supported in this manner, excavation was completed for the clearwater reservoirs and the concrete walls between reservoirs and pipe gallery were poured up to and embedding the ends of the supporting steel beams, which became permanent supports for the pipe and the concrete and tile operating floor above. All temporary timber bents were then removed and excavation was completed for the pipe gallery.

One thing that made the construction of the dividing walls extremely difficult was the limited clearance provided in the original design between walls and influent pipes. At some places this was not more than 2 in.

Circulatory mixing basin

The new reinforced concrete mixing basin is a duplication of the two existing ones. It is 40 ft. in diameter and 18½ ft. deep to a hopper bottom; the gutter slopes down 5½ ft. to the central outlet. It sets flush with the ground and is protected by a 2½ ft. ornamental cutstone handrail.

After chemicals have been added in the raw water flume, the water enters the three mixing basins through slots 7-ft. deep by 12½ in. wide. These restricted slots substantially increase the flow velocity to give a circulatory action for mixing the chemicals. Two vanes of 7 ft. deep, treated timber baffles, extending at right angles across the bottom hopper of the mixing chambers, serve as stationary paddles to insure thorough mixing.

A 42-in. cast iron pipe leads from the outlet of the hopper bottom to a 6 ft. wide by 6½ ft. deep concrete flume, which serves each coagulation basin through 8 manually operated sluice gates.

In keeping with the architectural design of the two existing coagulation basins, the new basin has an attractively designed cutstone handrailing. Located at one end of the old basins, it measures 157 ft. long and 106 ft. wide, with a 14 ft. depth from the concrete bottom slab to the overflow weir. The bottom slab slopes inward 1 on 2 on all four sides to facilitate cleaning as well as to improve operational efficiency. A treated timber A-frame baffle extends completely across each coagulation basin, normal to the flow of water, to keep the water flowing smoothly and evenly from the inlet sluice gates to the outlet overflow weir.

Filter plant extension

So well did the architectural design of the 126-ft. wide by 69-ft. long extension of the filtration building follow that of the original plant that only close observation can tell where the new construction begins. This is marked by a vertical expansion joint in the exterior walls and a double line of interior columns at the junction of the old and the new work.

All new construction below ground is reinforced concrete. Above ground the interior columns are concrete, sidewalls are brick trimmed with limestone and the roof is reinforced concrete (pan construction) with a prepared composition roofing. The interior of the filtration plant is finished with salt glazed brick for a height of 4 ft. above the filter floor and the remainder is plastered to provide a light and sanitary appearance.

Each of the two clearwater reservoirs, located beneath the filter beds, are 11½ ft. deep, 50 ft. wide and 180 ft. long. The 4 rapid-sand filter basins, measuring 50x28 ft., are equipped with cast iron drains covered with 18 in. of graded gravel and 24 in. of filter sand. Filter blocks are of the Wagner type, 10⅝ in. long, 9⅝ in. wide and 4½ in. deep. A clear height of 15½ ft. is maintained from the top of the filter floor to the roof.

Plant again shutdown

In constructing the filtration plant extension below ground level the existing endwall was left in place and a new one poured against it. This required the plant again be shutdown for a 24-hr. period; during this time the city's water was treated by chlorination only, while the old clearwater reservoirs were emptied and a hole cut through their endwalls into the new reservoirs. For that part of the extension above the groundline the old brick endwall was removed and a false wall of timber and tar paper constructed to protect the operating plant from the weather.

Expanding the city's existing network of water mains and distribution lines was deemed of equal, if not greater, importance than increasing the capacity of the filtration plant.

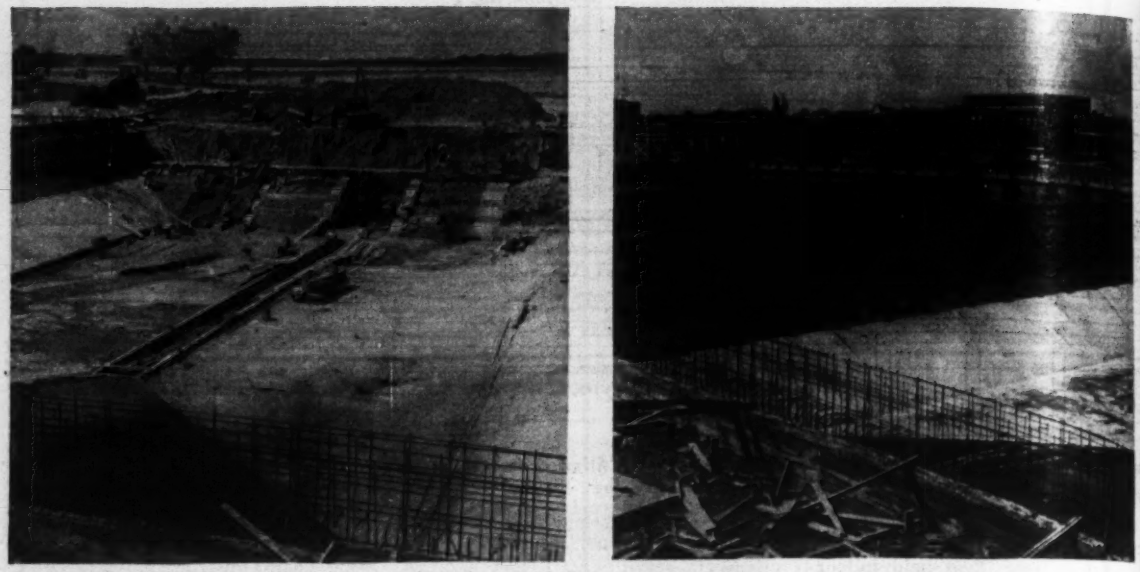


Fig. 5. Sloping sidewalls and endwalls of the new coagulation basin (left) were founded in blue shale. The new basin is located adjacent to the two old ones (right) in which can be seen an A-frame treated timber baffle.

Tulsa, with its 200,000 population, has no satisfactory well supply, and thus is entirely dependent on the filtration plant, storage lakes and conduit line from Spavinaw Dam.

Several miles of force mains and feeder lines were laid to serve new war industries and to relieve the burden on the city's overtaxed distribution system. The Douglas aircraft assembly plant alone required a 5-mgd. supply of filtered water.

One of the outstanding pipelaying projects, both as to securing materials during wartime and from a construction standpoint, is the 17,000 lin. ft. of 36-in. and some 5,000 lin. ft. of 30-in. cast iron force main from the filtration plant into the heart of Tulsa. Other cast iron feeder lines installed under this program include: 3½ mi. of 16-in. and 2 mi. of 10-in. pipe to serve the Douglas plant and a large aircraft modification center; 2 mi. of 24-in. pipe and 5 mi. of 12-in. line serving various sections of the city.

An analysis of the existing distribution system was made by the Hardy Cross method to determine the size and extent of new lines needed. With the sizes and lengths of new pipe determined, it became a race against time to secure the necessary priorities and materials to complete the job.

Throughout most of its length the 17,000 lin. ft. of new 36-in. bell and spigot force main (57 car loads) parallels the Santa Fe Railroad line and is located within a 50-ft. right-of-way adjacent to the railroad property. Class 200 centrifugal cast iron pipe was installed where the line crosses under the railroad track, and Class 150 was used for the remainder.

Pipe was delivered at a railroad siding in 16-ft. lengths, the largest of which weighed about three tons. Pipe was unloaded by a crawler crane, hauled by truck to the construction site and unloaded with channel skids.

Excavating the trenches

Trenches were excavated with a bucket ditcher, the bottom being hand trimmed to grade to receive the pipe. Very little dewatering of trenches was necessary, although a few trench pumps were used. Neither was it necessary to brace but very little of the trenches, which reached a maximum depth of 10 ft. Where rock was encountered, the trenches were over-excavated and backfilled with sandy soil to the bottom grade line of the pipe.

All backfill to the top of the pipe was hand placed and mechanically compacted with compressed air tampers. Selected material then was bulldozed into the trench and a slight mound of earth left above the trench for settlement. After this fill had settled all excess material was removed flush with the adjacent ground. All joints in the pipe were caulked with braided hemp and a sulphur compound was used for jointing material.

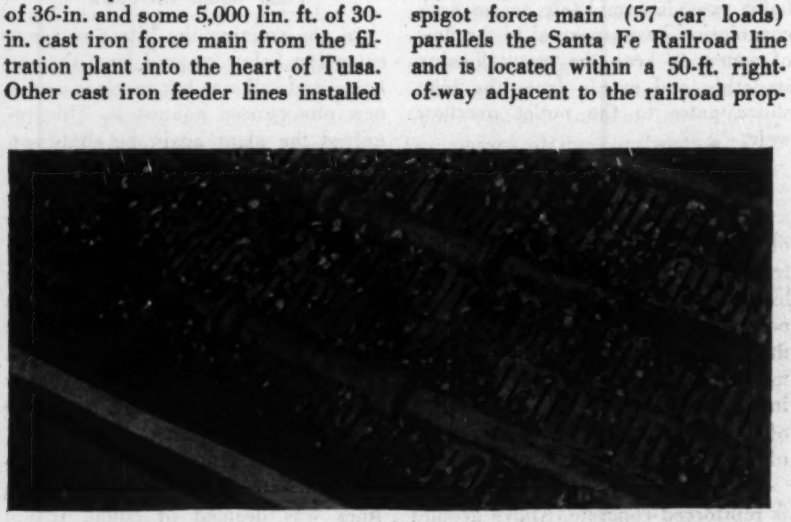


Fig. 6. Cast iron underdrains and precast concrete filter blocks were covered with 18 in. of gravel and 24 in. of sand.

Fig. 7. Operating gallery in the filter room. A clear height of 15½ ft. is provided from the filter floor to the roof, and good natural lighting is obtained through generous use of skylights and side windows.

With the filtration plant enlarged to a 40-mgd. capacity, the next step in the development of a water supply sufficient for future needs is to increase the amount of supply and storage at the plant. An application is being filed with the Federal Works Agency to create additional storage at the plant to supplement the two existing lakes. Studies also are being made to increase the flow of raw water in the conduit to Spavinaw Dam.

The two existing lakes, Lake Sequoyah and Lake Mohawk, located adjacent to the filtration plant furnish a total storage of 840 mg., enough for a 30-day maximum monthly rate of consumption or 45 days of average consumption. These lakes are filled during the winter months and, during the heavy summertime demand, are used to supplement the 23 mgd. furnished by the Spavinaw conduit. The delivery of this line can be increased 1.5 mgd. by increasing the head on the conduit at Spavinaw Dam by installing a propeller type pump driven by a semi-diesel engine. Since summertime pumpage has reached a maximum of 33 mgd. and averaged 28.5 mgd. for a two-month period it is considered necessary to construct a third storage lake of at least 500-mg. capacity.

Construction contracts

Contracts for enlarging the plant proper were held by the F. D. Ford Construction Co., Cordell, Okla. One, for $220,000, covered the new mixing basin, the addition to the filtration building and some yard piping and grading. The other contract covered the new coagulation basin at a cost of $75,000. The Federal Works Agency financed 40 percent of the cost, with the remainder being paid out of city funds. Work on these units was started in April, 1942 and finished in October 1943.

Hired labor installs pump

Installation of the 15-mgd. high pressure electric pump was made by the city using hired labor. It cost $45,000 completely installed, including a 1,000-hp. synchronous motor and about 3 mi. of 3-phase transmission line. The FWA also participated in the cost of this unit, which was installed by October, 1943.

A contract for the 20-mgd. steam turbine centrifugal pump, including all necessary piping, was held by the Turbine Equipment Co., New York City, for $80,000. This unit was placed in operation on Aug. 20, 1944.

Dobbson & Robinson, contractors, Lincoln, Nebr., installed the 36-in. and 30-in. force mains from the filtration plant into the city of Tulsa at a total contract cost of $350,000, which also was financed in part by FWA funds.

The pipe was purchased from the American Cast Iron Pipe Co., Birmingham, Ala. This project was started in January 1943 and completed by the following October. Water mains to the Douglas plant and in the distribution system were installed by the city's own forces.

F. D. Ford superintended the plant enlargement performed by his company, Ernie Boyer was superintendent of construction on the new force mains and C. C. Clark superintended the installation of the 20-mgd. steam turbine centrifugal pump. L. H. Strock, Hazen K. Hibbard and Dyall H. Leewright represented the FWA as construction engineers.

W. F. McMurry, water superintendent for the city of Tulsa, supervised the preparation of plans and construction of the several units. H. T. Thayer was engineer in charge of construction, A. B. Jewel is assistant water superintendent and Geo. F. Phillips is office engineer.

Structural designs for the filtration building extension, coagulation basin and mixing chamber were patterned after those in the old plant, which were originally prepared by Black & Veatch, consulting engineers, Kansas City, Mo.

Ship Models Assist Harbor Reconstruction Work

Models of the principal steamers using a coal shipping port in England were used to assist the replacement of the timber facing of the quay with a concrete structure. This reconstruction work was complicated by the necessity of keeping in operation the machines for delivering cargo coal to steamers at the loading berths of the quay. Thus, when the engineer planned to undertake a particular section of the work, it was necessary to confer with the harbor master and the railroad superintendent as to what steamers were due for loading and if they could be served at other than their usual berths. It was also necessary to consider the available working periods between tides, as there was a tidal range of more than 20 ft. twice daily.

The several ship models were made on a scale of 40 ft. to the inch, showing the funnels, masts, deck houses, loading hatches and other critical features. With these models and a map of 40-ft. scale, berthing positions for individual steamers could be determined in relation to the loading machines and to that part of the quay which the engineer desired to occupy.

Fig. 1. Dredging of Bourg-Larose cutoff was completed quickly to form the closing link in the Intracoastal Waterway.

Enlarging the Intracoastal Waterway

***Contents in Brief**—Safe and improved shipping service along the Gulf of Mexico is assured by completion of the Intracoastal Waterway enlargement from Galveston, Tex. to St. Marks, Fla. A huge dredging plant dug the Bourg-Larose cutoff at a rapid rate to form the closing link in the canal.*

COMPLETION OF THE BOURG-LAROSE cutoff just west of New Orleans, the closing link in the stretch of Intracoastal Waterway between St. Marks, Fla. and Galveston, Tex. will provide nearly 800 mi. of improved channel for coastwise shipping. The cutoff was virtually completed on April 10.

An additional 200-mi. section between Galveston and Corpus Christi, Tex., now under construction, will be finished sometime this year. Extension of the system to Brownsville has been authorized although funds for its construction have not been provided to date.

This new construction includes the improvement and enlargement of the old 100x9-ft. Intracoastal Waterway to a bottom width of 125 ft., and a minimum depth of 12 ft. Part of the waterway traverses protected bays and sounds of the Gulf of Mexico. Certain portions utilize existing bayous and old canals, while other sections, including the Bourg-Larose cutoff, have required the construction of a new channel.

Enlargement of the Intracoastal Waterway was undertaken primarily as a war project designed at the time to afford protection for coastwise barge traffic from enemy submarines as well as to increase the volume and to expedite the movement of petroleum products and other vital war materials from Texas to the East Coast.

The importance of these improvements to wartime shipping is borne out by the fact that under the old system a 4-barge tow could transport only 20,000 bbl. of oil or gasoline, while with the deeper and more efficient channel a 3-barge tow will transport 35,000 bbl. of fuel. Many stretches of the canal can be navigated as much as 20 percent faster, thus saving at least two days on a round trip from Port Arthur, Texas, to Carrabelle, Fla.

Construction was started in December, 1942. The speed at which it got underway and the rapid rate of progress not only established new records in dredging work, but its successful completion in such a short time stands as a tribute to the resourcefulness and ingenuity of the Corps of Engineers and civilian employees on the job.

Rapid construction was of paramount importance due to the submarine menace prevailing at the inception of the program as well as to expedite coastal shipping. The work was started with such a rush as to preclude any possibility of the Army Engineers preparing detailed plans on which to receive unit-price contract offers. Hence the usual method of contracting the work was abandoned in favor of the "leased dredge" system. Under this procedure, dredging operations followed immediately behind the channel survey and the scene of operations was changed upon short notice as necessary to permit the greatest prosecution of the work. Also, it was possible to attack the job simultaneously at many points.

Leased dredges

Under the terms of the dredge lease, contractor furnished and operated his dredging plant, complete with crew and all operational equipment including fuel and fuel barges, floating discharge pipe, shore pipe and supports, derrick barge, tender and water barges. Payment for dredging was on a basic contract hourly rate for the

ctual time of moving excavated ma-erial through the discharge pipeline. Adjustments in the basic contract ourly pay were stipulated for various perational activities such as the time equired for moving and changing winging anchors, making necessary hanges in discharge pipes on pontoon nes, changing the centrifugal pump mpeller, making transition from the loating line to the shore line, moving rom one job to another, and for vari-us other operations incident to pros-cution of the work. No payment was llowed for loss of time under certain onditions resulting from negligence n the part of the contractor.

Around-the-clock construction

Dredging, in general, was on a 24-our basis, including Sundays and olidays. The engineering crew for ach dredge included one chief in-pector and three sub-inspectors whose uties included logging of the various hases of dredging operations and lassifying the reasons for any inter-uptions in the work. The chief in-pector reported to the project engi-eer who, in turn, was responsible to he head of the dredging section of the . S. Engineer office.

Cooperation of the contractors and redge masters was of the first order. t not only was a matter of meeting eir payroll and of making a reason-ble profit, but there was also a strong esire to complete the work in as hort a time as possible to help the war ffort.

One resourceful army officer in-reased production in his area by ex-ting the spirit of competition among s contractors. He assembled them in ne of his motor launches and toured e different dredging projects in that cality. By seeing the methods em-oyed and progress made by rivaling ntractors, each contractor returned his work vowing to step up his pro-uction.

By July 1, 1943, most of the leased-redge work had been completed. The vernment engineers by this time had repared plans and specifications on rtain sections of the waterway en-rgement, and these were executed der unit-price contracts. Such a oject is the Bourg-Larose cutoff lo-ted about 40 mi. west of New rleans.

Under a unit-price contract, pay-ent is made on the volume of spoil moved, based on a unit contract of-fer per cubic yard, and subjected to certain restrictions for over-dredging. Contract offers must, however, come within the limits of the engineers' sealed estimate. If not, they may be negotiated to a common agreement. Failing in this, the government may perform the work either by leased dredge or by government-owned equipment employing hired labor.

All right-of-way for new canals or enlargement of old channels for improving the Intracoastal Waterway, including areas on which spoil is deposited is furnished by the local interests. The government is not empowered to negotiate for any such areas. The contractors' unit price offered for dredging covers all costs for removing the material. He must also construct all dikes necessary for retention of the dredged material and provide drainage of the discharge water either into natural waterways or back into the excavated canal.

Moved millions of yards

The enormity of the task of enlarging the Intracoastal Waterway is well illustrated by the yardage of material involved. Within the New Orleans district alone covering some 35 mi. of canal east of New Orleans and extending about 245 water miles west of that city, 53,500,000 cu. yd. of material were removed to form the enlarged channel.

Dredging operations in the New Orleans district began Dec. 19, 1942. The Rigolets-New Orleans section ly-

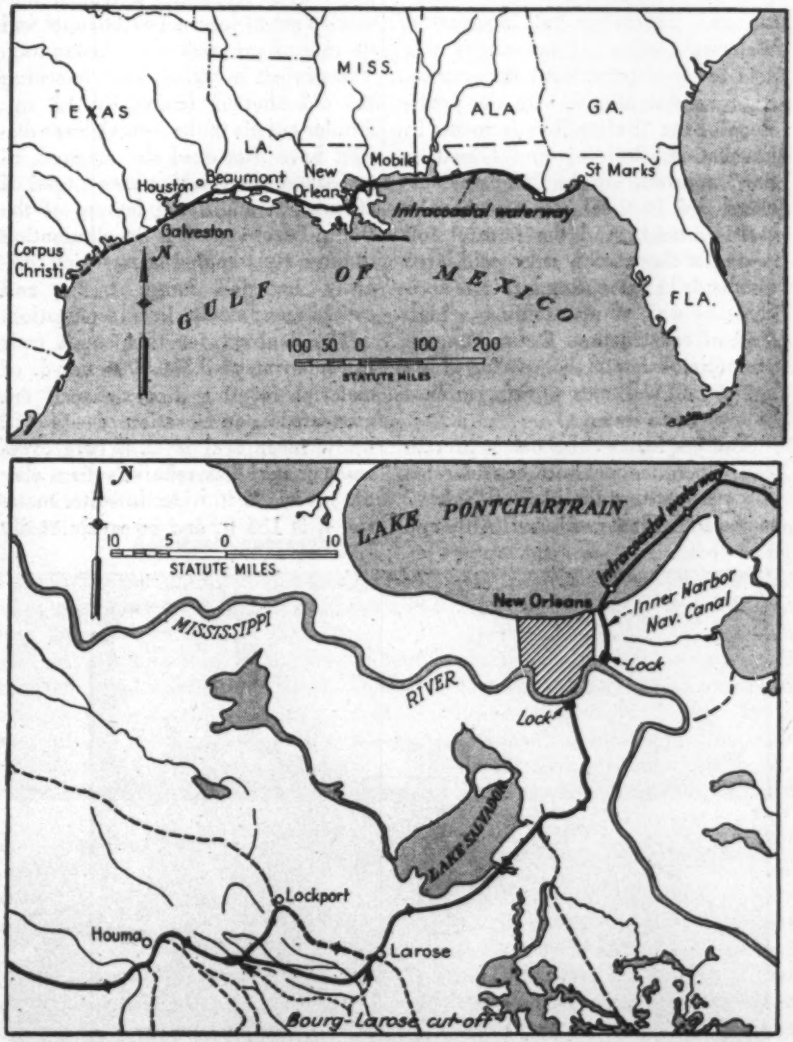


Fig. 2. Enlargement of the Intracoastal Waterway (top) now extends from St. Marks, Fla. to Galveston, and soon it will be completed on to Corpus Christi. The Bourg-Larose cutoff (bottom) eliminated three right-angled turns and shortened the route by 4.8 miles.

ing to the east of New Orleans and containing 11,500,000 cu. yd. of spoil was completed the following July 18. The 102-mi. long Mississippi River-Atchafalaya River section extending west from New Orleans and containing the Bourg-Larose cutoff involved removal of 20,500,000 cu. yd. of material. The Atchafalaya River-Calcasieu River section in the western section of the New Orleans district was completed last December 1. It involved the removal of 21,500,000 cu. yd. of material.

A breakdown of the total work in the New Orleans district discloses 34,500,000 cu. yd. of material removed by leased dredges, 3,000,000 cu. yd. by government-owned plants, and 16,000,00 cu. yd. under various unit-price contracts.

Throughout all the work of enlarging and improving the Intracoastal Waterway safety of operations was held to be of paramount importance. Rigorous compliance with the provisions of the "Safety Requirements in Excavation, Building and Construction" approved by the Chief of Engineers, Dec. 16, 1941, was stipulated in each contract. And the faithful following of these safety rules paid large dividends in preventing lost-time accidents as well as maintaining a high level of construction. Outstanding in promoting safety is the wearing of life belts by all workmen working around or over open water.

Another feature of accident prevention which has met with considerable success is selling the idea of "safety" to the individual workmen. Although reluctant to accept the idea as a vital part of his daily routine, continual presentation of safety methods through illustrations and personal contact, has done much toward making the average workman safety conscious.

Goggles for machine operators, first-aid kits, machinery guards, fire extinguishers, safe walkways and other safety features are the rule aboard dredging plants rather than the exception. Of equal importance are the sanitary living conditions required aboard a dredging plant. Food is wholesome and good, and plenty of potable water is provided.

Bourg-Larose cutoff

Construction of the Bourg-Larose cutoff is of particular interest inasmuch as it represents a typical full-section cut to form a new channel and its rate of progress was outstanding. This project is 15½ mi. long, lessening the old channel length by 4.8 mi. Similar cutoffs in the New Orleans district have shortened the original intracoastal canal in that area a total of 30 mi. An additional feature of the Bourg-Larose cutoff is the elimination of three right-angled turns which seriously impeded barge traffic and caused many tie-ups in transportation.

The contract for this cutoff calls for removal of 8,300,000 cu. yd. of material forming a box-shaped cut excavated to an elevation of—14.8 ft. below mean seal level. Where excavated material is relatively firm clay the cut is 140 ft. wide. In softer material it is 155 ft. and in exceptionally soft marsh it runs 190 ft. wide. These extra widths are to compensate for the sloughing action of the canal banks under barge traffic, and are designed to provide a final channel section to be maintained to elevation—12.8 and with a bottom width of at least 125 ft.

Fast dredging

The rapidity of progress on the Bourg-Larose cutoff almost defies visualization. Excavating a channel section that runs 10,000 cu. yd. per 100-ft. station, a huge cutterhead dredge discharges a pay-quantity of 4,400 cu. yd. of humus, silt, sand or silty clay per hour for a daily output averaging 95,000 cu. yd.

A 7-ft. long by 6½ ft. dia. 6-blade basket cutter driven by two 350-hp. electric motors and rotating 20 r.p.m. removes a slice of earth 18 ft. deep and 7 ft. thick over the full channel width in just two passes of the cutter.

The dredge then is walked forward 7 ft. under its own power by raising the anchoring, or pivotal, spud at one corner of the stern, lowering a 16-ton spud at the other corner, and skewing the dredge forward. The anchoring spud is then droped into position, the other spud lifted out of the channel bottom and the barge is skewed back into line—thus completing one forward set, or movement.

The cutterhead operates at the end of a 68-ft. long, 120-ton steel ladder that moves vertically. Lateral movement is provided by swinging the entire dredge about the pivotal spud at the stern. Movement of the cutter back and forth across the canal, and walking of the dredge forward is accomplished by a system of cables run out sidewise along two steel booms at the bow and down to 6-ton anchors embedded in the mud outside of the canal.

An enormous floating plant

The dredge itself is a great fully equipped floating power plant that can be made ready to go to sea on 24 hours notice. It measures 44 ft. wide by 240 ft. long from rear spuds to front of cutterhead and has a draft up to 12 ft. It sleeps 60 men although its crew varies from 75 to 150.

A huge centrifugal dredge pump powered by a 4,400 hp. steam-driven turbine discharges the spoil through a 28-in. pipeline running back onto a spill barge and up over the spoil dike.

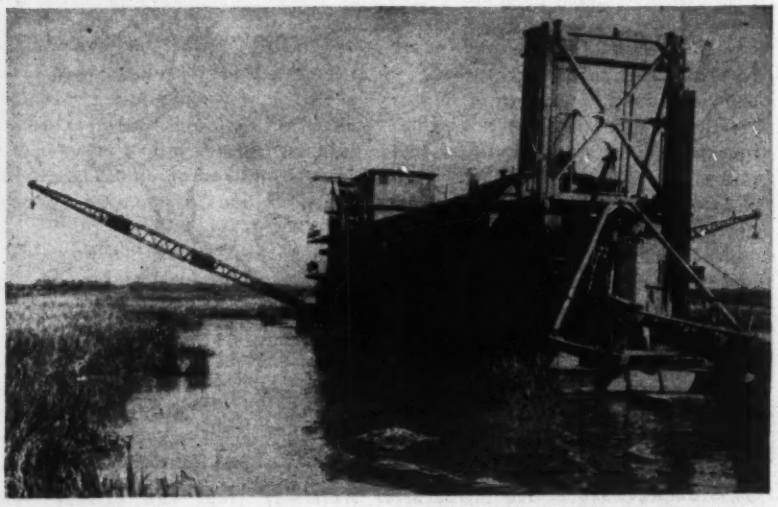


Fig. 3. Averaging 4,400 cu. yd. of pay dirt per hour, the cutterhead dredge, Gulfstream, completed the 15½ mile cutoff in record time.

Fig. 4. Louisiana Highway 78 crosses the cutoff on a new movable pontoon bridge near Larose. A trussed-beam anchor arm (right) connects the pontoon to a pivot pile about which the pontoon is rotated by a gasoline motor, housed at the far end, operating shore-anchored cables.

adjacent to the canal. Its impeller varies in size from 78 to 88-in. in diameter, depending on the type of material being moved, length of discharge pipe and height of lift. All auxiliary equipment on the barge is electrically operated by a 1,200-hp. high-pressure steam turbine generating 750 kw.

This complete dredging plant also includes 1,500 lin. ft. of floating discharge line; 6,000 lin. ft. of shore line; one 300-hp. and two 200-hp. tug tenders; a 3,500-bbl. oil barge; one derrick barge with a 15-ton swinging boom; two deck barges and a quarters boat. The spill barge, 120 x 32 x 8 ft., has a rake both fore and aft to permit close approach to the canal banks. It carries a wye-connection for the discharge line to facilitate discharging on either canal bank. A derrick on the spill barge supports 130 ft. of line for discharging well away from the canal.

All spoil dikes are built in advance of the canal excavation by a clamshell derrick barge. Although the right-of-way for the canal proper is furnished by local interests, the government secures only an easement for the spoil area. The land owner retains title to the property. Along some stretches of the canal it was necessary to completely encircle the spoil area with a dike to protect the contiguous property, install a weir at the most remote corner of the enclosed area and provide adequate drainage channels for the excess water from the canal excavation. The cost of all such work is included in the contractor's unit price for canal excavation.

Only one main highway crossing is required over the Bourg-Larose cutoff. It is on Louisiana state highway 78, just west of Larose, where a movable pontoon bridge was completed March 13 by the operations department, Corps of Engineers. The simplicity of construction and easy operation of this structure is worthy of note.

A reconditioned steel barge, 32 ft. wide by 120 ft. long floats in the center of the canal forming the central span. It carries a 26-ft. concrete roadway deck slab, protective curbs and a treated timber handrail. Approach spans are treated timber throughout, 30-ft. long and supported on small concrete abutments built into the canal banks.

Adjustable approaches

The outboard end of each approach span rests on a steel beam, each end of which hangs in a pile cluster and is supported by manually-operated chain falls and a steel block. This arrangement permits the outer end of approach spans to be raised or lowered to match the deck level of the pontoon barge as water level in the canal fluctuates. At the mid-span of the approaches, another steel beam hangs between two piles on adjustable steel rods. A hinged steel-plate ramp extending across the roadway carries the highway traffic from the approach span onto the floating span.

The bridge can be opened or closed in two minutes by rotating the pontoon barge about a pivot post set near the canal bank. A steel H-beam arm extends from the pivot post to one corner of the steel barge. A small gasoline engine supplies the power for operation of the bridge.

In its opened position the barge sets well back in a pontoon slip against a row of stop piles driven along the edge of the canal. Four sets of fender piles, 50 ft. long and faced with 12 x 12 in. treated timber fender guards are driven into the canal bottom near the bridge to protect it from passing craft.

Construction of the Bourg-Larose cutoff is being done under a unit price contract by the McWilliams Dredging Co., New Orleans, using their cutterhead dredge Gulfstream. L. C. Gibbs is general superintendent and A. L. Weisman is dredge master.

All enlargement and improvement of the Intracoastal Canal is being executed by the New Orleans District Corps of Engineers, under the direct supervision of Col. Geo. H. Hudson, district engineer, reporting to Brig. Gen. Max C. Tyler, division engineer, lower Mississippi Valley Division. Charles S. White is project engineer on the Bourg-Larose cutoff. W. B. Smith is chief of the inspection division and F. N. Geddes is head of the dredging and levee section.

At the beginning of the canal enlargement Col. DeWitt C. Jones was district engineer at New Orleans, Col. D. Gullat was district engineer at Mobile, Ala., and Lt. Col. W. G. Saville was district engineer at Galveston, Tex. Lt. Cols. Herbert I. Collins and John H. Anderson are the present district engineers of the Mobile and Galveston districts, respectively.

Municipal Works Comprise Half of Virginia's Postwar Projects

By S. L. Williamson
Engineer, Virginia State Planning Board
Richmond, Va.

POSTWAR PUBLIC WORKS projects planned for Virginia are estimated to cost $161,435,000, of which some $78,000,000 is called for by projects to be undertaken by municipalities in the state. The total program represents an outlay of $61.10 per capita, comparing favorably with the $61.50 for the United States as a whole based on data published by *Engineering News-Record*.

A public works committee of the Virginia State Planning Board has for some time set out as one of its major objectives the stimulation of local public works planning in the cities and towns of the state. Unlike some of the other states, where funds are available for this purpose, usually on a matching basis, it has been necessary in Virginia to encourage the communities to realize the importance of such planning and to proceed on local initiative, in most cases with drastically reduced staffs.

State-wide survey made

A state-wide survey of public works planning, undertaken in the fall of 1943, is now substantially complete. The Virginia State Chamber of Commerce, through a postwar construction committee headed by Fred McWane, assisted on this survey. The results, which include reports received from all of the 24 cities and 56 of the 63 towns over 1,200 in population, are shown in the accompanying table.

Several points in connection with the table should be noted. Highway improvements both state and local call for an expenditure of $81,117,374; water supply and sanitation works, $22,549,140; buildings, State, county and local, $44,062,125 in addition to an estimated total of $1,080,000 for agricultural office buildings which a tentative survey shows should be erected by 29 counties.

A few of the cities and towns by the nature of their replies indicated that little local emphasis was being placed on public works planning. This situation probably is not due to a disregard for the importance or necessity for such planning, but rather to the acute local shortage of technical help brought about by the loss of such help and the use of the remaining force in maintenance or other essential municipal functions.

An interesting indication of local feeling with respect to federal aid is found in the answers given by each community as to its financial ability or intent to proceed with each project under one of three methods. Of the total value of work proposed, cities indicated that without outside aid 65 percent could be undertaken; they were unwilling to undertake 28 percent; and 7 percent would be impossible to undertake. Percentages of the total value of work proposed by towns under the same conditions are 44, 33, and 23, respectively.

This is indeed a healthy sign so far as the state as a whole is concerned, yet a large number of small places which never had any real program of public works saw new water and sewer systems, street improvements, public buildings, etc., which would not have been built for many years, materialize during past periods when federal aid was made available.

The recent session of the General Assembly passed an act enabling localities to set aside funds for postwar purposes. Many are doing this and many others are reducing indebtedness and otherwise getting themselves into an excellent financial position to meet postwar emergencies. The state planning board is not in a position to advise on local financial matters except in a very general way. In fact, it is expected that the great majority of localities would not be at all amenable to outside suggestions on this point, except perhaps from financial institutions prepared to render such advisory service.

Planning progressing favorably

Compared with figures published by *Engineering News-Record* on June 1, 1944, Virginia's progress on public works planning compares favorably with the nation and is somewhat ahead of the southern states, showing 31 percent of the proposed work in the planning stage, as compared with 26 percent for the southern states and 28.8 percent for the entire United States.

If the experience gained in the recent depression did not leave an indelible impression for the need of planned public works, then to sell this need with any amount of publicity is a tough assignment. Even so, local officials are flooded with admonitions

STATE AND LOCAL POSTWAR PUBLIC WORKS PLANNING IN VIRGINIA BY TYPE AND AMOUNT

Type of Project	Amount	% of Total	Type of Project	Amount	% of Total
State highways	$52,942,000	32.9	Water distribution	$3,366,500	2.1
State institutions (buildings)	20,000,000	12.4	Gas and electric facilities	4,880,500	3.0
County schools	10,000,000	6.2	Parks and recreation	2,403,000	1.5
Streets and highways	28,175,374	17.4	Airports	1,847,000	1.1
Buildings (local)	12,062,125	7.5	Incinerators	1,298,000	0.8
Sanitary sewers	10,553,240	6.6	Miscellaneous	3,784,898	2.3
Storm sewers	2,790,500	1.7			
Water supply	7,331,400	4.5	Total	$161,434,537	100.0

om many agencies, public and pri-
te, to get ready for the big job that
s ahead.

Unquestionably one good reason
r the delay locally is the uncertainty
d indecision at Washington on the
me subject. In fairness to Washing-
n, the postwar problem is stupend-
s. However, the leadership in the
her public works program was fed-
al and, right or wrong, a statement of policy from Washington at least would be beneficial to the minor political subdivisions.

It is conceded that any type of public works program is purely temporary in nature so far as a permanent local economy is concerned and should only be undertaken when there is a need for relief of unemployment or else to provide projects which are immediately necessary. While it would be well to plan according to the above theory, the communities in Virginia would hardly be amenable to interference with their public works programs as to when and how they should be undertaken. We can only impress upon them the importance of holding back those public works projects which can be delayed until periods when employmet stimulation is necessary.

Hydroelectric Plants Planned To Double Brazil's Power Production

Brazil has under way or planned
ore than ten projects for construc-
n or improvement of hydroelectric
ants, which would more than double
e capacity of the country for electric
wer production, according to the
azilian Commission of Inter-Ameri-
n Development. The commission
ewed the big power development
ogram as "in line with the intensive
onomic progress taking place in
azil" in a report on Brazilian water-
wer resources and requirements
ade public by the Inter-American
velopment Commission in Wash-
gton.

"The demand for energy has
ached such a pitch in Brazil that the
tentiality now installed is incapa-
le of taking care of the real necessi-
s," the report pointed out. Not
ly are many central stations taxed
day to the utmost and need to be
panded promptly, but also the con-
uction of new plants is imperative.

List of projects

The report gave this account of
e more important hydroelectric pro-
ts:

The capacity of the existing stations
Ribeirao das Lagos in the state of
o de Janeiro is to be expanded by
out 40,000 kw. through construc-
n of a new dam and tunnel. This
te is the second largest consumer
electric power, taking about 26
r cent of total Brazilian production.
At the Usina do Cubatao in Sao
ulo the capacity is to be increased
about 55,000 kw. by installation of
ew generator, tunnel widening and
er work. The state of Sao Paulo,
ter of Brazilian industries, con-
s about 46.7 per cent of the power production installations of the country. The Cubatao station is the fourth in the world with a capacity of one million horsepower, of which 300,000 horsepower is installed.

A new hydroelectric station with two generation units of 10,000 kw. is to be constructed in Avanhandava by the Empresas Eletricas Brazileiras in the state of Sao Paulo.

Three plants with a combined capacity of 85,000 kw. are to be built in the state of Rio Grande do Sul, center of cattle raising and agriculture and possessor of a number of important industries.

One of the largest projects in the program is to be located on the Sao Francisco River on the boundary between the states of Bahia and Alagoas. This plant is to have a capacity of 500,000 kw. Its construction is to mark the first step in an extensive program for the industrial and agricultural development of the rich northeastern territories.

The Rio Pardo basin and the Rio Doce valley, both in the mineral-rich state of Minas Gerais, are to be the sites of sizable projects to support the economic development of both regions. The basin holds deposits of zirconium and high quality bauxite. The valley is the gateway to what is authoritatively described as the richest known iron ore reserves in the Western Hemisphere. Valuable deposits of mica and manganese also are located in the valley.

Extensive projects are already under way in the Rio Doce valley for railroad construction, housing, public health improvement and expansion and modernization of mining operations. Much of this development work is being carried on with United States assistance. (*ENR* Dec. 30, 1943, vol. p. 954).

A project under consideration for the Paulista-Caraguatuba sea coast counts on utilization of 500,000 horsepower in the Serra do Mar in the region of Ubatuba and the basins of Paraibuna, Paratinga and Lourenco Velho Rivers.

The program would provide well in excess of 1,230,000 kw. of additional electric energy. This total is just about the combined installed capacity of the various Brazilian stations today.

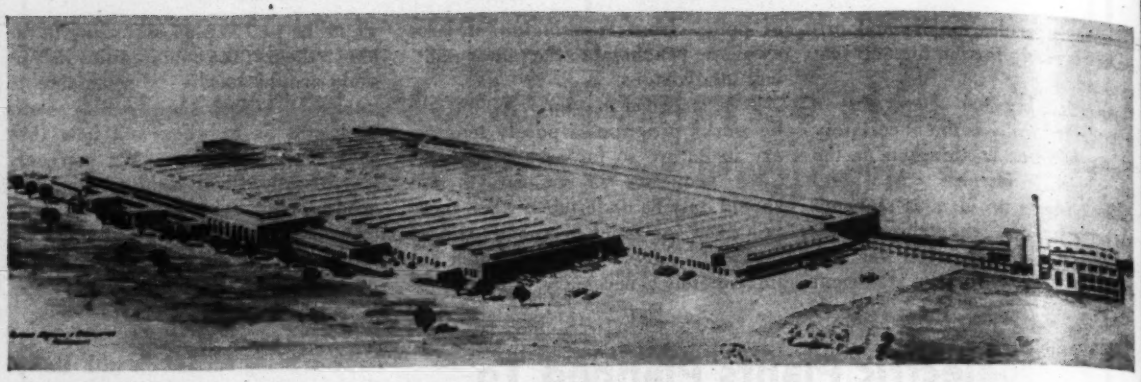
The survey estimated Brazil's hydraulic potential in excess of 20,000,000 horsepower.

Trains vs. Planes at Unusual Grade Crossing

Believed to be unique in railway practice is the recent establishment of an airport runway grade crossing on the London, Midland and Scottish Railway Company's lines in Northern Ireland. This interesting construction is described in a recent issue of *The Railway Magazine*, a British journal.

The matter arose out of a wartime need to base larger aircraft at an airdrome adjacent to the railroad, thus making necessary a longer runway. The only direction in which an extension could be made was across the railroad. The problem was considered from all angles, including those of relocating the railroad or of ramping the runway over the track, but the only solution, in view of the urgency of the work, was a level crossing with adequate signalling.

Modified double-line block signals and telephones were installed between the crossing-tender's hut and the control tower of the airdrome to provide complete safety for both trains and planes.



How the architect-engineers visualize the completed Army postoffice for overseas mail at New York.

"C/O Postmaster, New York"

Thomas H. Creighton
Alfred Hopkins & Associates, Architects-Engineers
New York, N. Y.

***Contents in Brief**—Hereafter package mail for overseas will pass through a postoffice of its own in New York instead of being serviced in a section of the city postal establishment. Covering 12 acres, the project is being built under a rush schedule of 4½ months. Located on the site of the old Madison Square Garden Bowl in Long Island City, foundation conditions were difficult, requiring both piles and spread footings. Concrete block walls, timber truss framing and gypsum roof are the pricipal elements of construction. Ventilation and lighting are aided by long monitors.*

THE DESIRE OF THE PEOPLE at home to send packages, home-town papers, magazines and the like to relatives and friends in the Army overseas has resulted in such large volumes of package mail that a building especially designed for the purpose of handling it has been made necessary. On the leveled site of the former Madison Square Garden Bowl in Long Island City, N. Y. there is arising a structure covering 14.5 acres, which will employ more than ten thousand people during the peak Christmas load, and will require the services of fifty railroad cars daily, bringing Army mail into the building on two tracks and taking it away, on the first lap of its trip overseas, on another. Built under the direction of the Corps of Engineers, it will be known as the U. S. Army Postal Concentration Center.

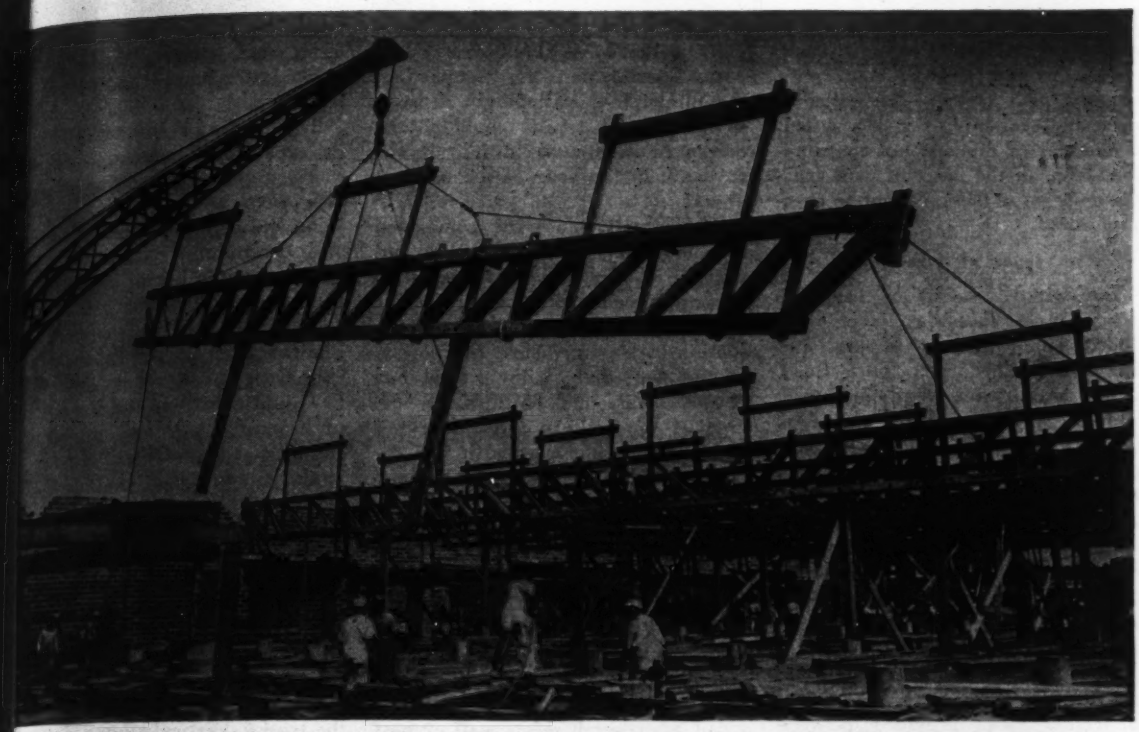
The U. S. Engineers, in planning this project, regarded speed as the primary consideration in the construction of the building, and speed was the keynote during design. Design and construction methods, with such a telescoped time schedule, were required to be simple, straight-forward, functional. The quickness with which things could be designed, obtained and erected in place was the one criterion that overshadowed all others. The timetable is as follows:

Conference with arch.-eng.	May 16
Grading cont. let, work begun	May 19
Fnd. drgs., and specs. comp	May 19
Fnd. cont. let, work begun	May 26
Superstr. drg. and specs. comp.	June 12
Superstr cont. let, work begun	June 19
Beneficial occupancy required	Sept. 1
Entire completion required	Oct. 1

How the building will function

Essentially, the building is designed as an industrial plant. The raw material—unprocessed mail—arrives at the southwest end of the building, (see p. 115) either by rail or truck. Delivered onto platforms it is routed into a U. S. Post Office work space of 350,000 sq. ft., which comprises 30,000 work units grouped into nine fire-walled areas. Here civil post office employees will process the mail up to the point at which they must stop for security reasons. When they have arranged it according to key numbers, and bagged it, the material is then moved to the work area of the Army Post Office section, where it is marked for its proper destination. The Army Post Office occupies approximately 85,000 sq. ft. of floor, and is divided into two fire-walled areas. From here the mail is moved to platforms at the southeast corner of the building, where either trucks or railroad cars pick it up.

The employees' entrances are on the north side of the building, which parallels a main thoroughfare—Northern Blvd. Along this northerly unit are also grouped the main toilets and "swing" rooms (locker and rest rooms), administrative offices, infirmary, and a cafeteria, the latter designed to seat 800, and capable of feeding 7,200 people in a 24-hr. period. Additional toilets are located in the center of the building so that no employee works farther than 300 ft. from such facilities. Provision for expansion of the building, if it should



Timber frame, concrete block walls and gypsum roof characterize New York A.P.O. under construction on site of old Madison Square Garden Bowl in Long Island City. Top: Lifting half of a 160 ft. span continuous truss into place with columns and monitors attached; left, laying 12-in. cinder block partition wall; center, load of gypsum plank being loaded on roof; right, exterior wall consisting of 8-in. cinder block, 2 in. air space and 4 in. concrete facing block.

e required, was made in the planning.

Light and ventilation are obtained n the tremendous work area by means f monitors over each bay. The fire alls between work areas are punctured by 10x8 ft. openings, protected y sliding fire doors. Observation balonies run across the work area, making it possible for all employees to be nder unobstrusive watch.

The structural makeup of the building involves a reinforced concrete floor on fill, spread concrete foundations where they were possible, piles where borings indicated that they were necessary; concrete block cavity-type exterior walls; 12-in. concrete block fire walls; 4 in. concrete block partitions; interior wood posts; wood trusses carrying wood roof joists, on which there is a roof construction consisting of 1½-in. gypsum plank, rigid insulation and built-up roofing.

To speed both design and construction, a grid, or modular system was used on a large scale. Bays 16 x 32 ft. were made standard, and all major structural divisions—exterior walls, posts, fire walls, bearing walls—are located on these grid lines. A typical truss could, therefore, be used for practically all situations. Many deci-

sions which might ordinarily have waited for determination were made quickly on the basis of conformity with the grid system. The value in speed and economy of such a system of modular or dimensional coordination, even on the basis of grid spacings so large as these, cannot be overemphasized.

Two types of foundations

The foundation design was governed by the fact that the site included some fill over swamp, and also took in the former sports Bowl. In the swamp area wood piles were definitely indicated, since time was not available for a comprehensive soil analysis, which would have been required if the structures were to be set on spread footings with a low soil pressure. With the comparatively light loads imposed on interior foundations, a two-pile group was designed for this situation. Pile caps are concrete. To compensate for irregularity in driving, which would result in eccentric loading, a "moment connection" was provided between piles and pile caps by embedding the top of the pile 18 in. in the pile cap, and providing reinforcing bands around the piles.

In the Bowl area, the problem was not so simple. It had been an open-air amphitheatre, partly scooped out of the earth and partly built up on fill. Its surface was bituminous macadam of considerable thickness. The grading contractor broke up this paving and leveled the site, compacting the broken and crushed macadam along with other fill material in the deep part of the bowl. Following U. S. Army specifications for compaction, the fill became exceedingly dense—so much so that piles could not be driven more than 6 ft. into its 10 ft. depth in the area of the original arena.

Accordingly, since the compacted fill material provided such good bearing, it was decided to use it to support spread concrete footings. For the interior columns, the tops of the footings are 6 in. below the bottom of the floor slab, with a sand bed between slab and footings. In the case of the wall footings, carrying rather brittle block walls, it was decided to rest the footings at a somewhat lower level, with a maximum of about 3 ft. of fill under the footing.

Grade conditions made it possible for the reinforced concrete floor to be placed largely on natural earth. The floor was designed to be completely independent of the rest of the construction, mastic joints being provided wherever it meets wall or post foundations. The concrete is to be covered in the entire work area with a resilient type of industrial flooring with a base of unfibracted asphalt emulsion, troweled on.

Structural features

Walls of cavity construction, built of two separated thicknesses of concrete block, 8 in. and 4 in., were chosen for reasons of economy, availability of the material, and rapidity of construction. Alternate bids were taken for an integrally colored exterior block and a plain block to be painted; the contract was let on the former.

The building is structurally divided by expansion joints extending from footings to roof parapets. Careful details were prepared, to make these joints inconspicuous and yet effective.

A determining factor in the roof design was the use of available lumber. Large sizes and great lengths were avoided in trusses and posts. The trusses are a parallel-chord splitring design, continuous for the five bays that constitute the 160-ft. width of a masonry walled fire area; to simplify joint details all truss diagonals in each half of this 160 ft. length are inclined in the same direction. Wood columns are of laminated construction.

The railroad tracks enter the building in a slight curve, which had to be accommodated in the construction. In the railroad platform area, 66 ft. wood trusses span from the wall to intermediate steel columns between the tracks. Vertical sliding doors, 18 ft. square, protect the openings that allow train entry.

Ventilation and light

In the work areas, where much of the space is remote from natural air intake, full use was made of the monitors. Not only do they provide light and natural ventilation, but they are used as sources for a mechanical ventilating system. At each end of each monitor, a heating and ventilating unit is installed. It will pull in fresh

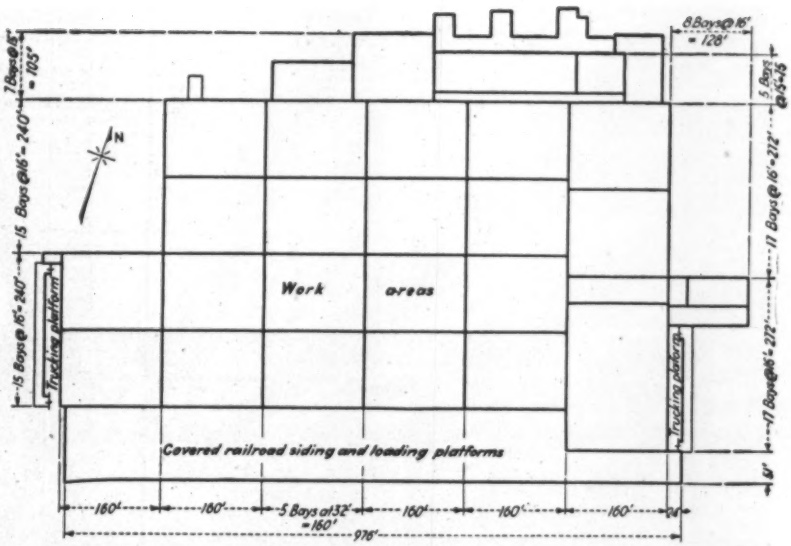
Two special structural details in the New York A.P.O. Left, wood columns are set on 18 in. dia. piers to raise them above floor level as protection from industrial trucks. Right, truss support detail involves a short end post bolted between clip angles that are anchor-bolted to the concrete cap of the cinder block pilaster.

er full thermostatic control and ute it in a duct system on the r ceiling through directional rilles. The size of the structure appreciated from the fact that llion cu. ft. of air per hr., is into the work areas. Radiators heaters are provided in the strative area and other rooms the work space.

Five miles of light fixtures

rescent lighting fixtures are ed for the work area. An inves- disclosed that they will pro- etter light at half the current mption of incandescent fixtures. portant factor in the decision e fact that incandescent fixtures have produced heat in each sq. ft. fire area equivalent to q. ft. of radiation. During sum- months this would, of course, nade ventilation of these spaces cult problem. More than 3,000 trip fluorescent fixtures of the sed in industrial plants are re- . The total electric load is 750 r motors and 950 kw. for light-

ishes throughout will be simple. terior concrete block wall will exposed, as will concrete block alls and partitions. In toilets, n, and other wet spaces a cera- lazed structural unit is used. gs are exposed up to the under- f the roof sheathing in work



Floor plan of building showing extent of layout and division into work areas by fire walls. Administration offices are along north side.

areas, finished with gypsum plaster board in a few instances.

The entire construction project is being carried out by the U. S. Engineer Office under Col. E. W. Garbisch, New York District Engineer. U. S. Army contracts for architect-engineer services were awarded to Alfred Hopkins & Associates who employed Fred N. Severud, consulting structural engineer, Clark, MacMullen & Riley, consulting engineers and E. L. Watner, consulting civil engineer. Contracts for construction were awarded as follows: grading, Charles F. Vachris, Inc.; foundations, Cayuga Construction Corp.; general contract for superstructure, John A. Johnson Contracting Corp. The U. S. Army Post Office portion when completed will be under the jurisdiction of Maj. Gen. Homer M. Groninger, commanding general, New York Port of Embarkation, with Colonel. R. E. Eggleton in charge. The U. S. Post Office portion of the building will be under the jurisdiction of Albert Goldman, New York City, postmaster.

Permit Fees to Finance Projected Wichita Street Repairs

rch for additional revenues to a 10-year street rehabilitation m has led Wichita's city coun- enact two ordinances imposing fees for the use of public prop- or private purposes. The ordi- become effective in September, ling to the International City gers Association.

ordinance requires the pay- of fees for street curb cuts; the provides for the payment of an- ermit fees by persons, firms or rations using public property for e purposes.

annual fee schedule under the ordinance is as follows: Fifty cents a square foot for areaways, loading platforms, sidewalk elevators, coal holes and similar openings in or structures on, under or over public property; $15 each for clocks supported by public property; $10 each for overhead hoist beams and cranes; 10 cents per cubic foot for tunnels for private use; 10 cents per gallon capacity for tanks under public property; 2 cents per cubic foot for vaults or subsurface space; $2 per linear foot for private car tracks; 50 cents per linear foot for pipe lines and conduits; $5 each for wells on public property; 25 cents per square foot for other uses of streets or alleys.

Though no estimate was given as to the amount of money Wichita expects from the fee ordinances, the association pointed out that the street rehabilitation program calls for the expenditure of $41,500 a year for the next five years.

Definite priorities assigned

Steps leading up to the street rehabilitation program and enactment of the revenue fee ordinances included the personal inspection of Wichita's 265 miles of paved streets by the city engineer, who turned in a uniquely detailed report and program. The report listed, on a block-by-block basis, the current condition of each pavement with particular reference to the needed repairs, heavier maintenance, or necessary construction or reconstruction and assigning definite priorities to each item.

Fig. 1. Seven 130x200-ft. hangars are built into one rigid-frame concrete structure at Buffalo, N. Y.

Seven Hangars with Modern Equipment In Rigid-Frame Concrete Structure

Howard J. Snitoff
Associate Engineer, U. S. Engineer Office, Syracuse, N. Y.

Contents in Brief—*Meeting limitations of time, materials and labor, designers planned a continuous, rigid-frame type of concrete building encompassing seven 130x200-ft. hangars. Unusual falsework was used in construction of the reinforced continuous beams that support a prefabricated joist and precast slab roof. Hangar doors are of the overhead canopy type. A duct system of electrical feeder circuits saves copper, and a combination of mercury vapor and incandescent fixtures makes illumination approximating daylight. Steam unit heaters, a deluge sprinkler system, and a separate water supply are part of the project.*

CUTTING TIME REQUIRED for design and construction to a minimum and reducing form labor to a low level for a flight hangar at Buffalo, N. Y., was accomplished by selection of a continuous, rigid-frame type of concrete structure. Main spans are 130 ft. longitudinally and 25 ft. transversely with prefabricated concrete roof joists spanning the 25 ft. Precast concrete roof slabs form a base for a built-up roof and an unreinforced floor slab takes the load concentrations of the heaviest planes. Equipment installed in the building was designed for minimum requirement of critical material and to meet high standards of safety and operating efficiency.

The hangar is required to house large planes coming from the Curtiss-Wright Corp. and to provide needed space for pre-flight operations. Authorizing directives required a building 200 x 900 ft. to be made up of seven "hangars" separated by a row of supporting columns. Each unit was to have an open span of 130 ft. and a clear height of 30 ft. In addition, two lean-tos each 40 x 200 and one-story high were to be p vided for office shop and toilet fa ities for a working force of 700.

Designers started work on May 1943, with plans scheduled to go bidders on July 1 and completion the project specified for Novem 15. The usual wartime restrictions materials had to be taken into acco but, despite the extra time requi for design with whatever mater were available and necessity for g eral approval of preliminary pl the final plans and specifications w completed on schedule.

Scarcity of timber and structu steel predetermined the use of re forced concrete, which had the ad tional advantages of reduced main nance and least fire hazard. Preli nary studies were made with intention of utilizing concrete a frames but this was abandoned cause of excessive cost and time t would have been involved in the fo

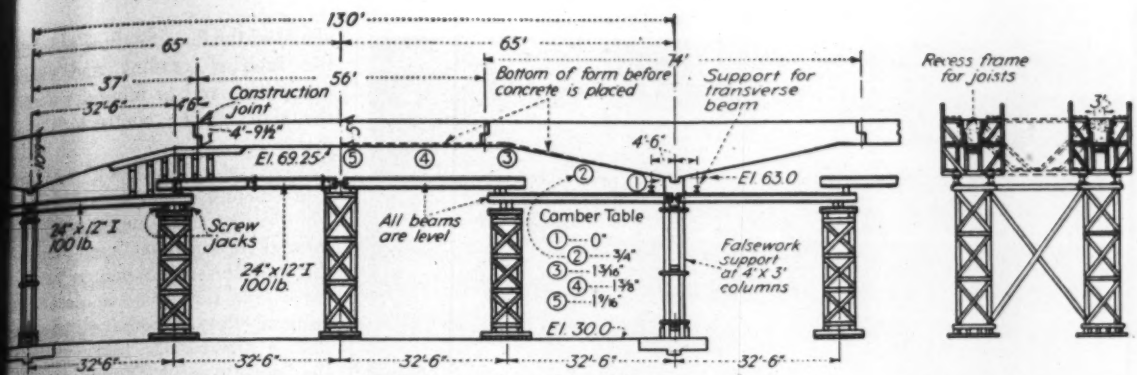


Fig. 2. Concrete was placed first in the haunched section of the beam adjacent to the column. To prevent any possibility of falsework settlement that would put a cantilever load on the fresh concrete an elaborate tell-tale scheme was devised and screw jacks set in the falsework to adjust for movement.

work. Use of long transverse spans to permit movement of planes between hangar sections appeared to be a much more costly design so 25 ft. was selected as the optimum transverse span. Continuous rigid-frame construction was adopted.

The structure is long and rather narrow, designed to accommodate only two or three planes in each of the seven bays, which here are designated as individual hangars. Reinforced concrete spread footings, the largest measuring 16 ft. 3 in. by 13 ft. 9 in., support the columns. Depressed keys are formed under the base of the footing to resist displacement due to unbalanced moment transmitted through the rigid frame.

Interior columns are 4 x 3 ft. with those in the hangar adjacent to each end of the building tapering to 6 ft. wide at the haunch line. End columns, which are designed to resist extremely heavy moments, are 10-ft. wide. Along the flying field side of the building the longitudinal frames, which support the hangar doors, are 11 ft. deep by 3-ft. wide, and are supported by 5-ft. wide interior columns and 10-ft. 6-in. wide end columns.

Seven continuous spans

The main interior frames, running longitudinally, consists of seven 130-ft. spans with typical beams 5-ft. deep by 3-ft. wide. The beams deepen from a point 37 ft. from the columns to form haunches with a total depth of 10 ft. 9 in. at the column line. In the design, construction joints are provided slightly beyond the extremities of the haunch. Frames of the building are spaced 25 ft. c. to c. and are tied at the column lines by 10-ft. 7-in. deep by 1-ft. wide cross beams and, just beyond the quarter points of the 130-ft. span, with 16 x 16-in. tie beams. Transverse expansion joints are provided at two points in the 900-ft. long structure.

Between main longitudinal frames prefabricated roof joists span 22 ft. A welded reinforcing unit, consisting of two small bars top and bottom with diagonally placed web steel designed for the proper length and the strength requirement of this project, was made up at a nearby plant. The joists were made with lightweight aggregate in a mix designed for 4,000 psi. strength, and used to fireproof and stiffen the reinforcing by compressing the concrete around it. The mix was fed into a machine which consisted of a traveling carriage and a rigid section containing a series of rollers which compressed the concrete at 2,000 psi. In the manufacturing process ⅜-in. dia. holes at 8-in. centers in the upper part of the web and ½-in. dia. holes at 24-in. in the bottom portion were made to facilitate fastening the roof slabs and to support lighting fixtures or other equipment that were to be hung from the joists. Two lines of

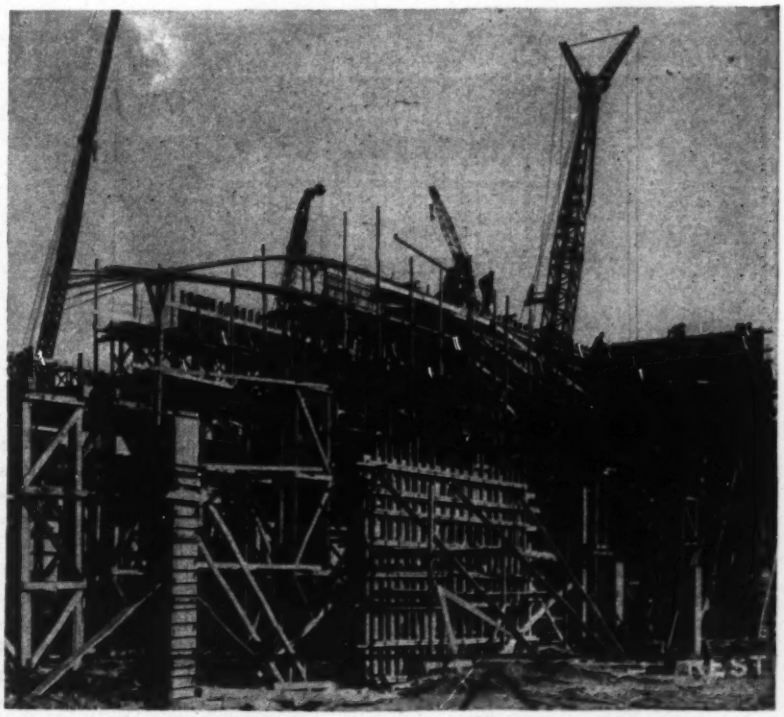


Fig. 3. I-beams on timber towers support the forms for continuous longitudinal beams. Long reinforcing required extra support.

Fig. 4. Structural glass blocks for part of wall, a combination of mercury vapor and incandescent lights, steam unit heaters and a deluge sprinkler system are installed in the rigid-frame concrete hangar.

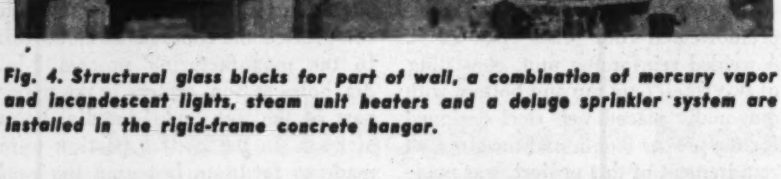


Fig. 5. Hangar doors rise 6 in. vertically then the top moves inward and the bottom outward as the door rises, forming a canopy.

4 in. by 10¾ in. concrete bridging were cast in place in each joist span.

The roof joists, at 4 ft. c. to c., supports 3½-in. deep concrete channel roof slabs, the latter being held by clips that bolt into the joists. Roofing consists of a three-ply built-up tar and slag covering, laid over 1-in. fiber-board insulation, applied to a layer of felt tacked directly to the concrete roof slab.

The floor is designed for 37,000-lb. wheel load, and consists of an 8-in. thick non-reinforced concrete slab. Expansion joints are provided on the perimeter of each of the hangar bays with alternate expansion and dummy joints dividing the floor areas into 11-ft. strips.

Construction procedure

To permit earliest possible occupancy work was started at one end of the building and progressed from hangar to hangar across the structure. General plan was to complete all of the work in each unit as rapidly as possible, the roof being placed ahead of the floor to allow added time for interior grading and concrete placement, and to minimize usage of the slab by the contractor's equipment.

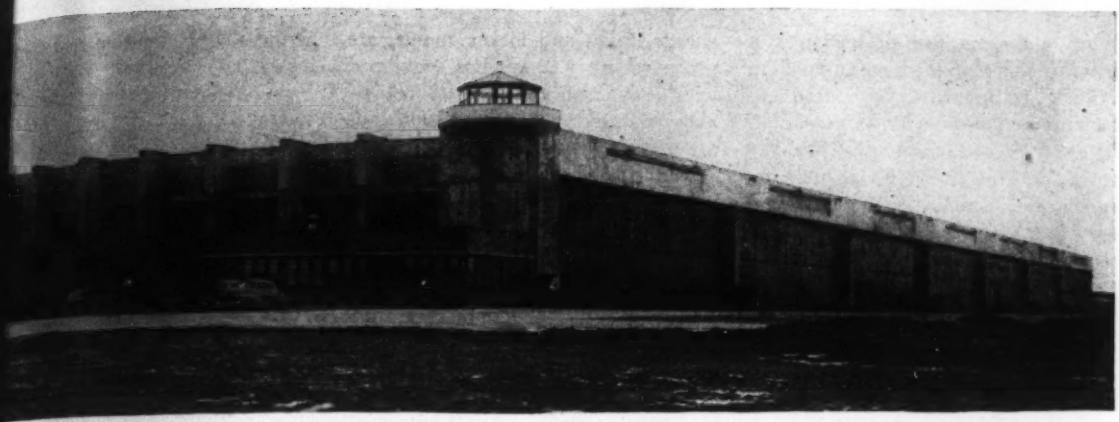
Most interesting of the construction schemes employed was that used for forming and concreting the longitudinal beams that are continuous through the seven hangars and the transverse tie beams at each of the column lines. Longitudinal beams have a construction joint just beyond the quarter-point of the span. First pour of beams was to this joint on both sides of the column with one-half the length of the transverse tie, at right angles to the main beam, placed simultaneously. Center sections of the main frames usually were placed within 48 hr. of the time the cantilever section was completed.

The continuous frame design made it necessary to form a rather large portion of the structure longitudinally at one time, and speed considerations made it essential to construct forms for the eight principal lines of framing at one time. Longitudinally, it was necessary to have the forms in place for a minimum of 1⅔ spans to place cantilevers in advance. However, to meet the required schedule, forms were built for one-half of the entire building.

Timber towers supported the falsework that carried the forms for the longitudinal beams as shown in Fig. 2. Similar falsework carried the load of the deep beams in the row of transverse columns. Forms were constructed of 1 x 6-in. D&CM. (dressed and center matched) sheathing framed to 3 x 4-in. studs at 16 in. c. to c. No lining was used.

To counteract any possible settlement of the falsework away from the one or two day old concrete when the added load of the center portion of the beams came on them, screw jacks were provided at the top of the falsework to permit necessary adjustment. An elaborate scheme of indicators for both vertical and tilting movement of the falsework was arranged so that even slight movement would be quickly noted. Actually, such care was taken in support that no discernible movement occurred during the construction.

For stability it was necessary to tie two adjacent rows of forms together and operate the crane in the alternate, open aisle. Space for swing and boom



. 6. The concrete frame of the hangars is exposed, the massive members providing all desirable architectural treatment.

eration was restricted in the 22 ft. tween frames, made much less by otruding forms and walkways. This advantage was partially overcome use of gooseneck jibs on the crane om and a side delivery bucket for acing concrete in the beam. Forms d falsework were stripped by the ane, carried ahead and reset.

Prefabricated concrete joists for e roof were set, by crane, into pre- ired recesses in the top of the main ngitudinal frame and brought to an actly level surface, then the ends outed into the pockets. Precast x 8-ft. roof slabs were laid over the ists and tied down to form a level d unyielding surface for the roof.

Canopy type doors

The seven main hangar doors on the eld side of the structure are of the otor-operated overhead canopy type, ch closing a portal measuring 125 x 31 ft., 6 in. Frames are of struc- ral steel and are designed to with- and 20 lb. per sq. ft. wind load in closed position. Each door is sup- orted by twelve cable suspensions. ix cables are gathered from each side the center line, wound about an operator" over the center of the oor, and returned over cable sheaves counterweights housed behind the ortal columns. Counterweights are 2-ton concrete blocks measuring 8 in. x 9 ft. x 12 ft., and travel freely.

During the opening cycle, the first otion of the door consists of a ver- cal rise of about 6 in., which un- cks the lateral latching system, and ermits freedom of motion from now, ice or other low lying obstruc- ons. Thereafter, the door tilts on its wn horizontal axis, and opens up- ard, with the lower half projecting outside to form a canopy over the portal. Upon closing, the door is automatically latched by means of a system of toggle bolts and keepers installed in the sill. In case of power breakdown, hand-chain operators are provided. The movement of doors is controlled to permit an instantaneous stop in any position, and continuation of up or down motion thereafter.

With conservation of copper imperative, considerable ingenuity was necessary in the design of the electrical installation. A 440-volt 3-phase system was required to meet the power and lighting demand. To eliminate a multiplicity of feeder circuits, a "bus-duct" system was used for secondary feeders. In addition to an appreciable saving of copper conductors, this provided much desired flexibility. The interior distribution system consists of two main ducts running along the rear wall of the hangars from the main transformers. These ducts feed power branches placed along the center columns, thereby permitting flexibility in motor connections. Lighting circuits are taken off transformers stepped down to 110–220 volts permanently connected to the bus-duct.

Mercury and incandescent lights

The main lighting fixtures are four-unit clusters consisting of two 400-watt mercury vapor tubes and two 750-watt incandescent lamps, hung 35 ft. from the floor. Because of the height at which the fixtures are mounted, reflectors are designed to direct illumination towards the floor. The combination of mercury vapor and incandescent lamps resulted in a blending of illumination that markedly approaches daylight. In addition to light and power circuits, the electrical installation included fire alarm, autocall and sprinkler alarm systems.

Steam unit heaters

Flexibility was again the primary necessity in the design of the heating system. The large expanse of door openings necessitated an installation that would be highly reactive to temperature changes. Steam unit heaters were chosen. Hangar areas are heated by projection type, down-blow unit heaters suspended from the ceiling. Each hangar is served by six units—the two adjacent to the canopy doors have 730,000 B.t.u. capacity and the remaining four are 420,000 B.t.u.

Toilet and locker rooms are heated by multi-blade type unit heaters, which operates as part of a ventilating system designed to keep those spaces free of gasoline fumes. One lean-to wing is similarly heated and ventilated, while the other wing is heated partly by radiation and partly by unit heaters.

Three low-pressure, steel boilers constitute the heating plant, which is housed in a boiler room separate from the hangars. The boilers are equipped with stokers, feed water regulators, and the usual automatic controls. Steam mains are run from the boiler room, through a service tunnel. Three lines of steam mains run longitudinally across the building to serve the unit heaters. Condensate is collected into transverse lines, which connect to a single return main along the rear wall of the building. The main hangar areas are ventilated by mechanical roof ventilators of the blackout type. They are rated at 18,500 cfm. at a static pressure of $\frac{1}{2}$ in. of water. Two units are provided per hangar.

An elaborate fire protection system is installed in the hangar, the high value of equipment to be housed and hazards of gasoline fumes necessitating extra precautions against fire. The sprinkler system originally was designed and partially constructed as a dry-pipe, fused-head system, divided sectionally by deluge curtains. Subsequently, it was converted in its entirety to a deluge system by substituting open heads for sprinkler outlets.

Separate fire systems

Fourteen separate systems were installed, each system operated by a deluge valve, which is actuated by heat releases appropriately spaced in the ceiling. Heat releases are equipped with temperature release valves, set to operate at 160 deg. F., and are connected to deluge valves by tubing filled with compressed air. In case of a break or a leak in the tubing, arrangements are provided for a low-pressure gong to sound before the deluge valve opens and allows water to pass into the sprinkler system.

Each system is equipped with two remote control devices, set to trip the individual systems manually. Deluge valves are connected to annunciators, and to the fire alarm system. All other areas, including offices, storerooms, garage, toilet and locker rooms, are protected by wet systems, equipped with flow alarm valves which actuate annunciators. A total of 2,400 heads are used in the sprinkler system.

The fire alarm system is of the closed circuit type, installed and maintained by American District Telegraph Company, with control board located in the boiler house.

Adequate water supply and pressure for the fire prevention system is maintained by fire pumps, connected to two reservoirs with a combined capacity of 750,000 gallons. Four 750-gpm. gasoline driven pumps and one 1,500-gpm., motor-driven pump are housed in a pump room adjacent to the boiler house.

Emergency reservoirs

The reservoir is of the ground storage type in which an area, in this case about 75 x 118 ft., is excavated to a depth of 4 ft. below natural ground and the earth removed is used to build a berm some 3-ft. high. Sides slope about 1 to 1 and sides and bottom are covered to make them watertight (*ENR* Jan. 14, 1943, vol. p. 34). Covering is 2-in. plank sheathing laid on 2 x 6-in. framing which rests on 2 x 10-in. mudsills spaced 4 ft. c. to c. Commercial practice is followed in applying a 4-ply built-up roof over the inexpensive reservoirs.

Because the building is part of the emergency war construction program no particular effort was expended toward architectural effects. However, structural elements, fully exposed, present an appearance of strength and stability, and are well proportioned, so that a noteworthy functional design is achieved.

With the exception of the lean-to, the facades of the building are composed of untreated surfaces with concrete columns and spandrel beams, the bays being divided into three elevations, the lower two glazed with conventional sash and the upper panels filled with structural glass blocks. Lean-to-walls are built of concrete blocks, faced with brick.

The structure was erected under the jurisdiction of the U. S. Engineers, Syracuse District, and under the direct supervision of the Western Area of that district. Designers were Duane Lyman and Associates, architects, assisted by Thomas H. McKaig, structural engineer, and Beman & Cande, heating and ventilating engineers, all of Buffalo. General contractor for the project was Poirier & McLane Corporation of New York City.

Milwaukee's Public Works Program Calls for 22 Million Expenditure

Milwaukee's city council recently approved a public works program providing for an expenditure of more than $22,000,000 in the next six years, according to the International City Managers Association.

The resolution adopted approving the program also sanctions annual review and revision of the long-term financial and public works planning; continues work of the technical committee which prepared the program; instructs the committee to revise a six-year program annually, extending the program one year in advance; and states the projects will be included in the annual budget as capital budget items after consideration by the board of estimates.

The technical committee's program includes $6,200,000 for sewers; $3,805,000 for new bridges and public buildings; $3,025,552 for street openings and widening; $3,000,000 for lake front development; $1,500,000 for playground developments and $458,000 for grade crossing work.

Reserve projects totalling $53,304,000 will be carried out if the public desires to spend the money. These include rehabilitation of blighted areas, off-street parking, and improved access routes to the central business district.

Plans are not based upon receipt of federal or state assistance. Any funds received from other governmental sources would be used to expand the program by moving from the reserve list many improvements which otherwise would be postponed until 1949.

A unique feature of the program is that it can be financed on a cash basis. The city's technical committee predicts higher tax rates, basing the forecast upon an expected sharp decline in income tax revenues after the war and the necessity of spending $12,000,000 to buy new equipment. However, the alternative may be a reduction of the six-year program.

The report, approved by the council, contains graphs, studies of population growth, budgets and other essential information and was prepared by a committee of municipal officials created by the council in 1941. Members include the commissioner of public works, the city attorney, the city planning director, the deputy city comptroller, a special assistant engineer and the municipal reference librarian. The former deputy city comptroller will serve as financial consultant to the group.

1. The emergency flood-relief project includes 1,530 lin. ft. of concrete girder approaches to Arkansas River bridge.

Arkansas Repairs Flood-Damaged Bridge

ntents in Brief — Additional waterway provided beneath a flood-maged bridge over the Arkansas River by replacing 1,600-ft. of washed-out proach fill with concrete deck girder spans. Simplified design permits eedy construction.

LTHOUGH AUTHORIZED as an emer-ncy flood-damage reconstruction oject, the new approach spans now der construction at the west end of present Arkansas River bridge on S. Highway 64 at Van Buren, Ark., ll furnish greatly needed additional terway. The inability of the exist-g bridge to handle floodwaters of Arkansas was proven in no un-rtain manner during the disastrous od of last May (*ENR* May 20, 1943, 720).

At that time the maximum crest n 3 ft. above low steel of the old ss spans, and 1,600 ft. of approach l and concrete pavement were com-tely washed out.

Another factor influencing the re-acement of this approach fill by a ries of bridge spans was the enlarge-ent work done by the St. Louis and n Francisco Railroad Co. on its idge located immediately upstream. e floodwaters had torn out the west utment and end truss span. In re-iring this structure, the railroad mpany had lengthened it consider-ably. It was readily apparent to the highway engineers that merely replacing the 1,600 ft. of washed-out fill would create a bottleneck in the river.

There are, in all, thirty four 45-ft. reinforced concrete deck girder spans in the new approach. They are carried on 21-ft. high open-column concrete piers, each pier being supported by eight 18-in. octagonal precast reinforced concrete piles averaging 38 ft. long. All piles were driven to refusal in shale, using a single acting steam hammer. The deck carries a 26-ft. clear roadway, cast-in-place concrete handrails, a 4-ft. sidewalk on the upstream side and a 2-ft. walk downstream. It is designed for an H-20 loading.

The present truss spans carry four traffic lanes; two on a 21-ft. central driveway and one each on two 11-ft. side drives. Consequently the design of the approach structure contemplates its being made into a 4-lane approach as soon as materials become available.

In view of this future expansion, the 2-lane approach spans are being constructed on one side of the final centerline of roadway, with the 2 ft. walk adjacent to that centerline. By duplicating the present construction the final approach spans will carry two 2-lane decks separated by a 4-ft. raised median.

Concreting operations

Concreting operations follow a uniform pattern. Since all spans are identical, timber forms and shoring can be used repeatedly with corresponding speedy progress. The concrete is mixed adjacent to the bridge site and deposited in place with a traveling crane. A toggle beam at the end of the boom permits both longitudinal and transverse dumping over the full roadway deck, with very little screeding of the concrete being necessary.

All roadway surfaces are finished with an all-steel screed spanning the full length of span. Supported by the frames for expansion joints, over each pier, this screed is operated transversely to produce a finished roadway surface free from undulations or corrugations and containing the required permanent camber.

In addition to being located on a heavily traveled highway, this bridge

Fig. 2. An all-steel, trussed screed, supported on the expansion joint frames at the piers, operates transversely to insure a smooth-riding concrete roadway surface.

over the Arkansas River carries two 20-in. water mains, an 8-in. gas main and telephone lines for servicing Fort Smith, immediately to the south, as well as nearby Camp Chaffee.

Since the Army was vitally concerned in maintaining these service facilities to Camp Chaffee, Army Engineers were the first to bridge the 1,600 ft. gap caused by the approach fill being washed out. Immediately following the flood, they jumped in and repaired the service lines, which had gone out with the fill, and constructed a ponton bridge to carry them until more permanent arrangements could be made. This ponton bridge also served as a pedestrian walkway.

Temporary timber trestle

Highway traffic was restored soon after the floodwaters had receded, when the Arkansas State Highway Commission built 106 15-ft. timber spans, carrying a 19-ft. roadway and one 3-ft. sidewalk. This temporary trestlework was built by force account, and with the greatest possible speed. So urgent was the need for a temporary bridge that all available contractors together with their organizations were pressed into service. Lumber and timber piling were secured wherever possible and the entire 1,590 ft. of structure was completed in 25 days.

Construction of the new 1,532-ft. long approach structure was started on Oct. 20 of last year. Completion is scheduled for the early part of July.

Included among the major items of this $399,000 structure are 3,300 cu. yd. of concrete; 740,000 lb. of reinforcing steel; 10,400 lin. ft. of reinforced concrete piling; 5,160 sq. yd. of concrete approach paving; and some 14,000 tons of stone riprap.

All construction is being done by the Arkansas State Highway Commission under its flood-damage program. The Pioneer Construction Co., Malvern, Ark., holds a contract for the work. Plans were prepared by N. B. Garver, bridge engineer, under the direction of W. W. Mitchell, director and chief engineer of the highway department. H. F. Bastian is principal design engineer, and E. E. Hurley is resident engineer on construction.

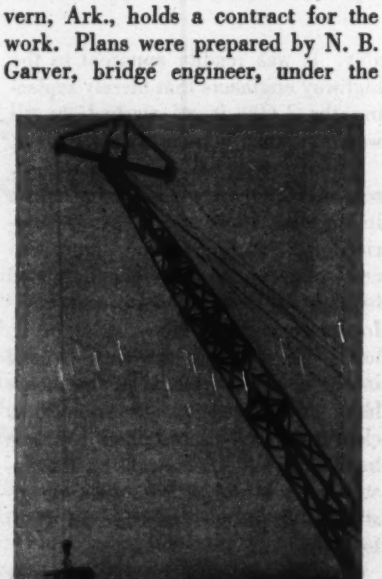


Fig. 3. Derrick boom with toggle-beam expedites placing of concrete in deck.

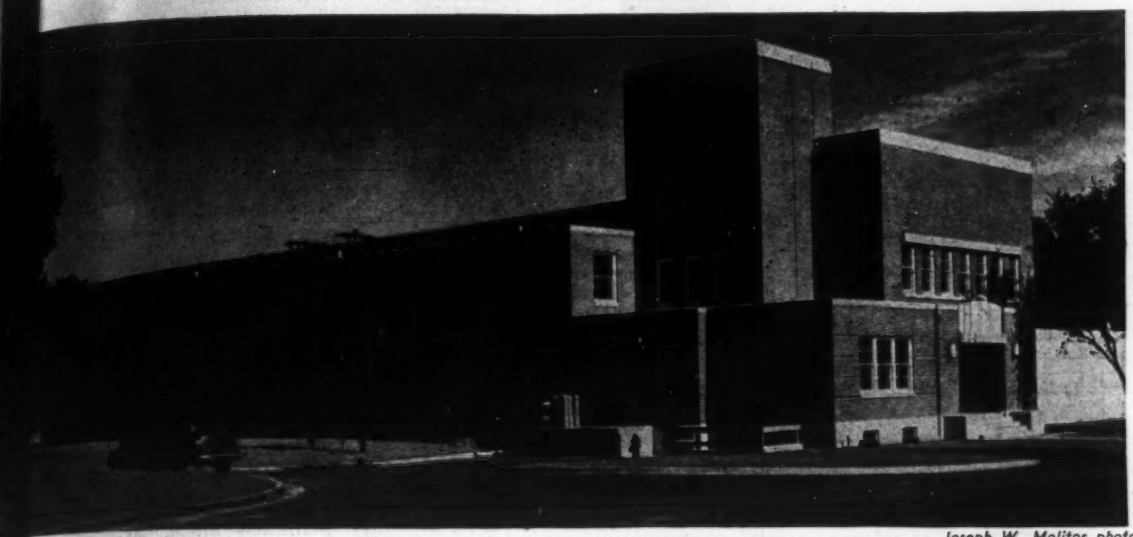
Water Treatment Devised for Chlorophenol Tastes

A new process for the removal of "chlorophenol" taste and odor in water supplies will be described by John F. Synan, J. D. MacMahon and G. P. Vincent, Mathieson Alkali Works, at the Sept. 14 meeting of the American Chemical Society in New York City.

The new process involves pretreatment with chlorine to sterilize, followed by treatment with chlorine dioxide to remove taste and odor. The chlorine dioxide is generated by passing a sodium chlorite solution into the discharge line of a standard chlorinator. A constant dosage of chlorine dioxide of 0.5 ppm. available chlorine is maintained, which is sufficient to remove all taste in a severely contaminated water.

Comparisons on laboratory and plant scales indicate that the new process is entirely effective even in cases where conventional methods of treatment are inadequate.

It is said that the new process eliminates "break-point" measurements and "break-point" failures, and effects considerable economy by reduction in the amounts of chlorine and carbon that ordinarily would be used.



Joseph W. Molitor photo

. 1. New 7-mgd. treatment plant at Wilmington, N. C. is characterized by compactness, flexibility and limited piping.

Salt-Free Water for Wilmington

***ontents in Brief**—A serious water supply problem at Wilmington, N. C., being eliminated by construction of a 7-mgd. treatment plant, a 21-mi. peline, and a pumping station. The treatment plant, which provides for pid sand filtration and the use of alum, soda ash, lime, chlorine and mmonia, is characterized by its compactness. To extend the pipeline across e Cape Fear River, a 708-ft. section of 30-in. diameter flexible-joint cast on pipe was pulled into place. A large part of the supply conduit, nstructed of reinforced concrete pipe, is supported on timber-pile bents.*

FTER NEARLY THREE DECADES of getting by" with an unsatisfactory ater supply the city of Wilmington, . C., is now completing the installa- on of a pipeline tapping a new urce of supply and the construction a 7-mgd. treatment plant. A bet- r quality supply ample at all times, us greater fire protection and lower eatment costs, was the objective.

In the past the city's supply was ob- ined from a branch of the Cape Fear iver through an intake but a few iles from the mouth of the stream. uring low flows and bad tidal con- itions the quantity of potable water as limited, and the treated water hen delivered to the consumer some- mes contained a salt content as high 2,400 ppm. or about one-tenth that f ocean water. In addition, the exist- g treatment plant, which was im- roved in 1909 by the addition of fil- rs and reconstructed in 1922, lacked both the desired capacity and flexibility.

Although construction to obtain a new supply had been considered by the city since the water system was first purchased back in 1909, adequate facilities were still lacking when the war began. With the influx of shipbuilding and other war workers the population in the Wilmington area increased from 33,000 to over 80,000. Water demands were doubled, making it imperative that corrective measures be taken.

To overcome the limitations due to inadequate treatment facilities a new 7-mgd. treatment plant was built (Fig. 1). A new source of supply is also soon to be available, as the old intake pipeline is being extended 21 miles to obtain water from the Cape Fear River just above Lock and Dam No. 1 at King's Bluff, about 38 river miles from the mouth of the stream. This new source, which also requires construction of a pumping station at the intake, will be ample in quantity, free of salt, and no more difficult to treat than the old supply.

Compactness characterizes plant

The new plant has been named the Sweeney plant in honor of John H. Sweeney, superintendent of the water works for half a century. The new building, which is of brick and reinforced-concrete construction, is two stories high with basement and measures 143x205 ft. in plan (Fig. 2). Important features of the plant are provisions for operating flexibility, compactness and simplicity of piping layout. The latter provides ready accessibility to all parts of the piping network and to the mechanical equipment.

Treatment facilities provide for rapid sand filtration and the use of alum, lime, soda ash, ammonia and chlorine. An accompanying drawing (Fig. 2) illustrates the layout, which is designed to permit straightline flow through the plant.

Raw water is delivered to the mixing chamber by an 8-mgd. pump. From this point onward the flow through the plant is by gravity. After the chemicals are added, the water passes to a 20x38-ft. mechanical mix-

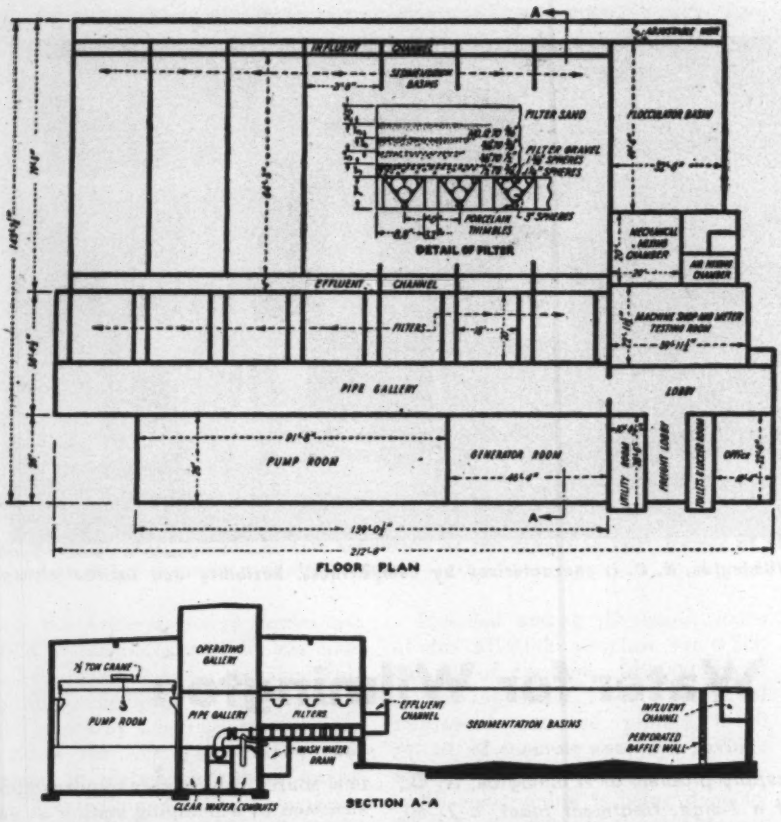


Fig. 2. Treatment plant provides for rapid sand filtration and use of alum, ammonia, chlorine, soda ash and lime. To reduce need for piping, seven 1-mgd. filters were placed side by side and a reinforced concrete conduit running the length of the plant was built to collect treated water; a similar conduit was constructed to deliver water for washing the filters.

Joseph W. Molitor photo

Fig. 3. Pumping equipment (in center of picture) in new plant is readily accessible for maintenance and repairs. Limited piping in gallery in background at lower level may be noted.

ing chamber, then to a 32x4[illegible] flocculator chamber, and next to [illegible] ft. wide channel along the end [illegible] seven 21x63-ft. sedimentation bas[illegible] From these basins the water reac[illegible] the seven 18x20-ft. rapid filters (e[illegible] of 1-mgd. capacity), and finally g[illegible] to the clearwater reinforced concr[illegible] conduit extending the full length [illegible] the plant below the filters.

Conduit delivers wash water

A study of Fig. 2 shows that a re[illegible] forced conduit, running almost [illegible] length of the plant, is used for d[illegible] tribution of the washwater. Usi[illegible] conduits of this type reduced t[illegible] amount of piping required and eli[illegible] inated the need for large quantiti[illegible] of critical materials; this, in tur[illegible] permitted much earlier completi[illegible] than would otherwise have been po[illegible] sible.

Washwater is distributed by [illegible] 8,100 gpm. pump, and the treate[illegible] water by three pumps, one of 2,10[illegible] gpm. capacity, a 3,500-gpm unit an[illegible] a 2,800-gpm. standby pump. Spa[illegible] is provided for installation of a dies[illegible] generator to supply power for opera[illegible] ing the mechanical equipment.

Construction of the plant require[illegible] one year and cost about $750,000.

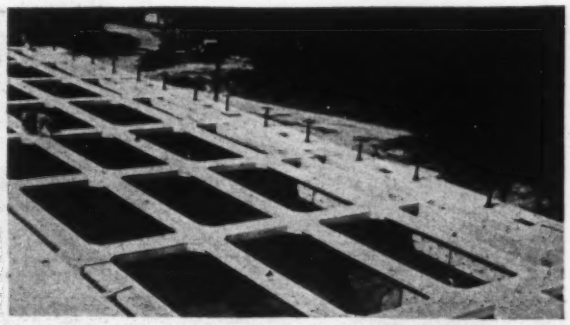
Pipeline well advanced

The work of extending the ol[illegible] 24-in. dia. cast iron intake pipelin[illegible] to obtain water above the lock an[illegible] dam at King's Bluff is well advanced[illegible] The extension crosses the Cape Fea[illegible] River near the city of Wilmington[illegible] and then runs along the west side o[illegible] the stream, ending at a small pump[illegible] ing station near the dam.

The new line is of 30-in. diameter[illegible] Except for the use of cast iron for th[illegible] river siphon and for two other smal[illegible] stream crossings, the conduit is being[illegible] built of reinforced-concrete pressure[illegible] pipe manufactured on the job by the[illegible] Lock Joint Pipe Co. Two phases o[illegible] construction of the pipeline are o[illegible] special interest.

One of the most challenging phases[illegible] of the pipeline job centered on con[illegible] struction of the Cape Fear River[illegible] crossing. On this work a 708-ft. sec[illegible] tion of cast iron pipe was pulled into[illegible] place as a unit. Stream crossings on[illegible] other projects have been built in this[illegible] manner, but few lines, if any, are of[illegible] this large size and length.

While a trench about 6 ft. deep was[illegible] being dredged in the stream bed for



Joseph W. Molitor photo

Fig. 4. Left: Good lighting, abundant space and choice of finish of ceiling and floor in operating gallery are expected to aid in the efficient operation of the plant. At the end of the war the timber railing will be replaced with metal rail. Right: The seven sedimentation basins were placed side by side with water delivered by channel at right end of tanks. Perforated walls will aid in even distribution of flow through basins.

the pipe, the 12-ft. sections were assembled on the west side of the stream on a runway (or launching way) slightly more than 700 ft. long. To reduce the amount of the force necessary to make the pipe move, the way was built on a 4 percent slope. The frictional load was further reduced by assembling the pipe on the launching way on two longitudinal greased railroad rails. In addition the ends of the siphon were sealed and 6 to 8 steel drums of 50-gal. capacity were tied to each section of the pipe to make the line buoyant as it entered the water, over 400 drums in all being used.

Pipe assembled on ramp

Because of the unstable soil upon which the pipe for the siphon was assembled, construction of the runway and assembly of the pipe was not easy. The runway or ramp was built with each bent supported on two 10-in. dia. timber piles 25 to 35 ft. long, the piles being driven with a crawler crane operating on thick timber mats. Because of its slope, the height of the ramp at the end farthest from the river was 30 ft. The posts of the bents were 12x12-in. timbers and the caps were 10x12's 14 ft. long.

Delivered by a barge moving along a channel parallel to and a short distance from the launching way, the pipe sections were assembled on the runway by the crane used in building the launching way. An extra heavy pipe with special flexible joints caulked with lead was used, each joint being equipped with 22 gibs held in place by screws. As each joint was added, its free end was raised to test the flexibility of the joint before adding the next pipe section.

Power for pulling the pipeline into place was provided by a steam hoist on the far side of the river and a gasoline-powered hoist on the launching side. To reduce the danger of pulling apart the 708-ft. length of pipe, the hoist on the launching side did most of the work by "pushing" on the end farthest from the water. To accomplish this action, the hoist was stationed on the center line of the pipeline a short distance inland from the elevated end of the launching way and a cable was extended from the hoist to the front end of the launching way and back to the landward end of the pipe. By such a hitch, the motive force from the hoist tended to shorten, rather than lengthen, the pipe.

Despite all the measures taken to reduce the force necessary to move the pipe, which had a total weight of over 200 tons plus that of the drums, considerable trouble was encountered in making the pipe move. Several days were lost due to broken cables and other delays, but once these difficulties were overcome, the siphon was pulled into place in a single day.

No leaks develop

After the pipe had been submerged by filling it with water, a diver traveling along the trench in which the pipe had been placed cut loose the steel drums. Because the water in places was nearly 30 ft. deep, the drums rose to the surface with great force, often jumping several feet above the water surface. A test of the line after the drums had been removed showed no leaking joints.

A second interesting phase of the pipeline work is the construction procedure now being followed in extending the line across swamps and areas of low-bearing soil. Reinforced concrete pipe was chosen for these areas, as well as for most of the rest of the line.

Rather than remove the unstable topsoil and muck, which was several feet deep in many places, it was considered best to support the pipeline on treated timber pile bents, a bent being used near each joint or on one every 16 ft. Two timber piles of 10 to 14-in. butt diameter and from 35 to 45 ft. long are used in a typical bent, the cap being a single 10x12-in. timber.

Cranes must work on mats

The bents are constructed by a crawler crane working on timber mats. The usual procedure is to construct sufficient bents for six to seven lengths of pipe, and then to place these sections on the completed bents. The sections of pipe are delivered by truck to one edge of the swamp and rolled on planks to the desired point along the line. Construction progress in the unstable areas varies greatly and has been delayed by bad weather. Nevertheless, on some days 100 ft. of pipeline supported on timber bents is constructed.

Bad weather has also delayed work on the pipeline on higher ground. Because of the abnormal, heavy rainfall and slow runoff, the equipment must frequently be operated on timber mats. A 2-yd. backhoe is used to excavate the necessary trench, which is made sufficiently deep to provide a minimum cover of 3 ft. over the pipe. The same machine, after digging each 16 ft. of trench, is employed to lower and join the next section of pipe. With simultaneous excavation and pipe lay-

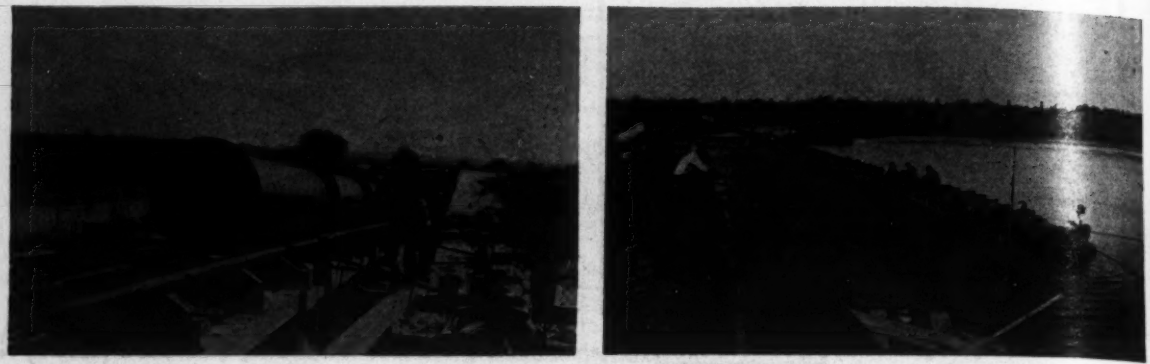


Fig. 5. Cast iron pipe for 708-ft. siphon under Cape Fear River was assembled (left) on two greased rails on a timber launching way on west side of stream. After some 400 steel drums each of 50-gal. capacity had been added to make the pipe buoyant, it was pulled across river (right).

ing, trouble from caving banks was reduced to a minimum. Backfill up to the springline is placed and tamped by hand, the balance being done by a bulldozer following closely behind the laying crew.

On construction of the first five miles of the line on high ground a crew of 14 to 18 men, not including drivers of the trucks delivering pipe, has been able to average on good days 300 ft. or more of pipe.

The 21-mile pipeline is scheduled to be completed late in September. Cost of this work, including the pumping station at the upstream end of the line, is $1,345,000.

Construction of the pumping station was started late in March. This work, which is expected to be finished in November, consists of construction of a reinforced concrete and masonry structure 20x45 ft. in plan to house two 4,900-gpm. electrically-driven centrifugal pumps and one 5,600-gpm. gasoline-driven unit.

Soon to start is construction of a 4-mg. clearwater reservoir near the new treatment plant. This work, which is expected to cost $207,000 is also scheduled for completion next fall. A reinforced-concrete covered reservoir is to be built.

Doing the Job

Wm. C. Olsen of Raleigh, N. C., who is represented on the $2,340,000 project by Charles Pearson as resident engineer, designed the new facilities and is supervising construction. A. H. Guion of Charlotte, N. C., built the filtration plant, and is constructing the new pumping station. The 21-mi. pipeline is being built by Price Bros. Co., Dayton, Ohio. For this firm A.W. Smith is resident engineer, and Roy P. Hess, general superintendent. The contract for the new reservoir has not been awarded.

For the Federal Works Agency, which is supplying 60 percent of the cost, C. L. Vickers is regional director, and C. F. Churchill, supervising engineer. The city is represented by J. A. Loughlin, city engineer, and M'Kean Maffitt, superintendent of the water department. For the Lock Joint Pipe Co., which is furnishing the concrete pipe, Roscoe Jones is superintendent.

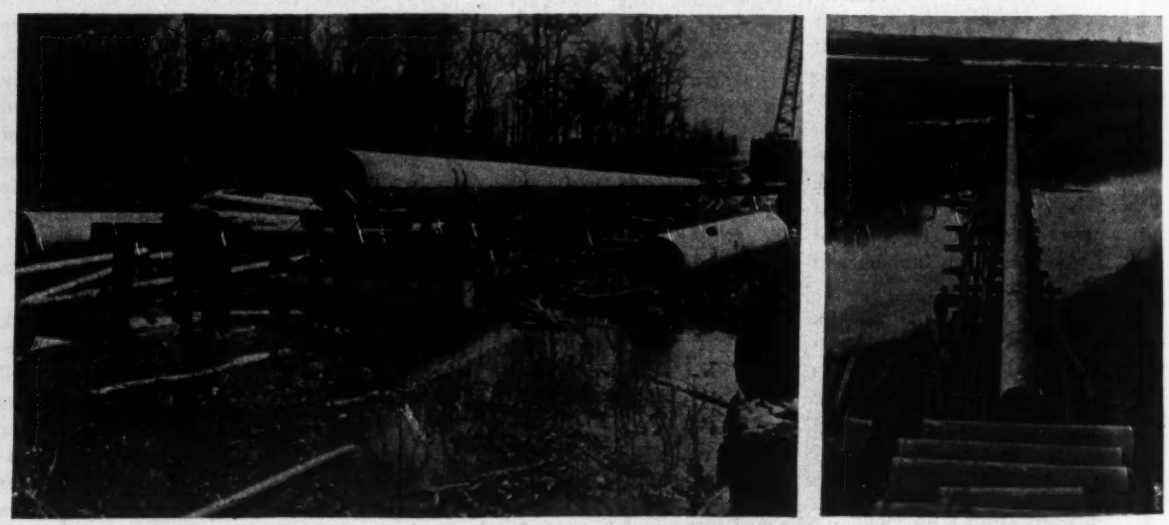


Fig. 6. Major portion of the 21-mi. pipeline is being constructed of reinforced-concrete pipe. Across swamps and other areas where low-bearing soil is encountered the line is supported on timber-pile bents. General procedure is to haul pipe to edge of swamp and then roll it to desired point along the line (left), but on one long section bents were made extra wide and the sections of pipe were delivered one at a time by a sled moving over a temporary track on the bents.

From Field and Office

ORKING PROBLEMS AND TIME-SAVING METHODS FOR ENGINEERS AND CONTRACTORS

CAMERA MEMORANDUM

To cool the concrete being placed around the steel penstock of Power Unit No. 3 at Shasta Dam 2-unit revolving lawn sprinklers proved very effective, according to the Bureau of Reclamation engineers in charge.

At Atlanta a small crew using a truck equipped with a telescoping tripod derrick and swinging crane is making rapid progress on water main construction.

Special Truck Speeds Main Construction at Atlanta

Through use of a special 5-ton truck the Atlanta, Ga., water department is making good progress with a small crew in constructing a 12-in. main. The truck, which is shown by an accompanying photograph, was equipped by the department's repair and maintenance forces at times of slack work. It has a swinging crane directly behind the cab and a telescoping tripod derrick at the rear end.

Power for both the derrick and boom is supplied by a take-off from the truck's motor. The all-welded swinging boom, which is 8 ft. long, was built of steel tubing. With this boom a section of pipe may be raised from one side of the truck and swung over to the other, an advantage where working space is limited. The derrick, which was made of 3½-in. dia. tubing, also has been found of value in unloading pipe and other work, due to the telescoping feature.

On the project illustrated the pipe had been placed along one side of the ditch by other equipment. By using the truck described to lower the pipe into place, a five-man crew can lay and caulk 1,000 ft. of pipe daily.

The truck is being used under the direction of W. Zode Smith, general manager of the water department, and Meredith Collier, superintendent of the department's construction and distribution forces.

U. S. Air Corps photo

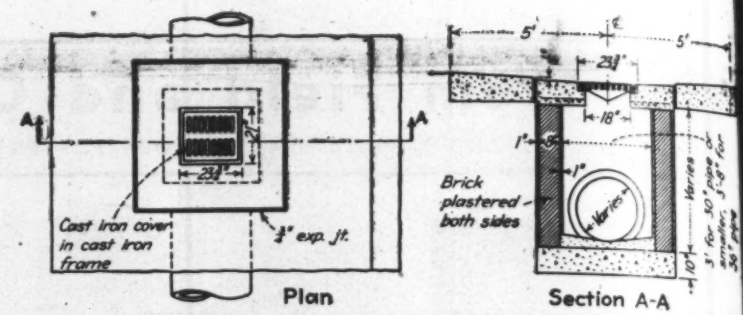
American military forces in the South Pacific are finding tractors equipped with full-revolving crane booms especially valuable in the unloading of supplies from boats drawn up on shallow beaches.

Runway Gutter Inlets Find Favor on Army Airfields

Gutter inlets along the edges of the runways at Warner Robins Army Air Field, Macon, Ga., have shown that this type of construction offers a number of advantages from the drainage standpoint and no objection on the part of the flying crews. The inlets, which are spaced along both edges of the runway on 200-ft. centers, are illustrated by the drawing at right.

On a typical 150-ft. wide runway, the inlets are placed in a 10-ft. wide strip added at each side. A maximum depression of 3 in. is provided at each inlet, but between inlets the depression is eliminated. On runways built on a grade, which is generally the case, this design causes the water to be caught at the first inlet it reaches, rather than running for a long distance along the 10-ft. wide strip. The design also eliminates loss of earth along the pavement so common in the french drains and permits quick removal of the water.

To obtain criticism of the inlet design from airplane pilots landing tests were made with Army planes. The aircraft landed at a speed of 115 mph. at three angles to the runway, 30, 60 and 90 deg. These landings were no rougher than along the center line of the runway in the normal manner, according to the pilots. Movies and high-speed still photographs of the landing tests also indicated no "rough" landings.



Gutter inlets of this type on three southeastern army fields are revealing a number of advantages.

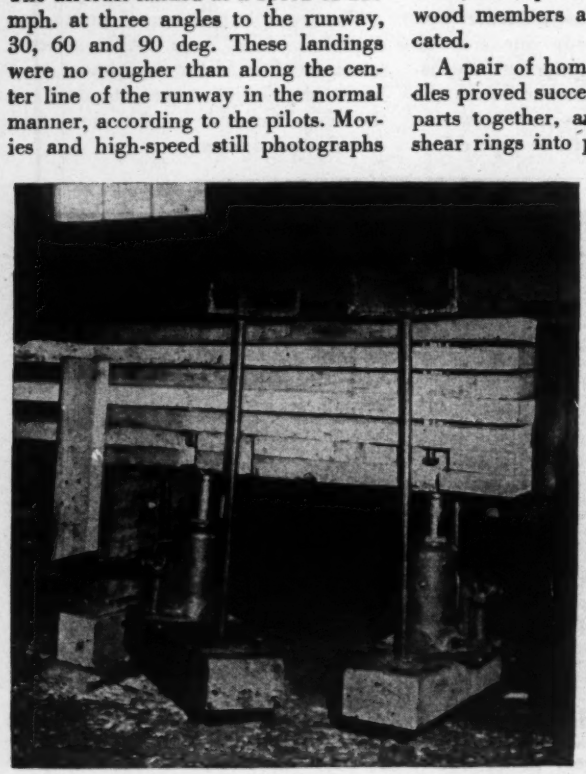
Inlets of this type have been used at two other fields in the South Atlantic Division. Those in the runway extensions at the Warner Robins air base were installed under the direction of Maj. Edgar B. Boynton, resident engineer, and Lt. Rosser D. Elkins, chief of operations on the airfield.

Jack Assembly for Fabricating Wood Trusses

On one of the far Aleutian outposts the army engineers are building warehouses with wooden roof trusses fabricated at the site. The trusses are bolted construction with corrugated shear rings at the main joints. This type shear ring does not fit into routed kerfs, but is pressed into the adjoining wood members as the truss is fabricated.

A pair of home-made jacking cradles proved successful in pressing the parts together, and thus forcing the shear rings into place. It consists of two sets, each containing one hydraulic jack, a yoke of two rods, a timber block base and a channel iron cap.

The truss members, cut and bored in advance, are assembled on a jig. As the joint is built up by slipping each member over the bolts, the shear rings are put in proper place. Next the jack cradles are placed around the joint (one of the rod yoke connections at the channel cap is slotted for easy assembly) as shown in the accompanying illustrations. Operation of the jack then forces the truss members together and embeds the corrugated shear rings. This method has been found fast and economical.



Corrugated shear rings are forced into joints of truss assembly by hydraulic jacks.

The *Stake* of the United States in Expanding World Trade

WITH the war in Europe racing to a climax, and with a sure pattern for the defeat of Japan already outlined, American business is confronted with the need for an immediate decision on long-term economic policy.

What is this country's foreign trade program to be after the war?

No intelligent appraisal of all the factors any longer can allow us to postpone considering the issue merely because, in the past, foreign trade absorbed barely eight per cent of our production.

Actually, a whole new set of conditions was injected into the picture by the first World War; but we persisted in ignoring these new factors.

Almost overnight, the United States was transformed from the largest debtor nation in the world to the second largest creditor nation. At the same time, we made faster technological progress than any other nation. Thus we created the need for more dollar exchange on the part of the rest of the world and simultaneously made it harder for other nations to earn dollars.

Today, as another, far vaster war is approaching its end, those changed circumstances are magnified. America has new responsibilities—to itself, and to the world.

Our war-inflated industrial capacity cannot be allowed to drop back to prewar levels without causing a domestic crisis which we dare not permit.

And, because so much of the world is geared to the American industrial machine, we can no longer contemplate calmly the repercussions of a largely self-sufficient trade program or of an unplanned foreign trade program. Either would inevitably set the stage for the next world war.

☆ ☆ ☆

If we are going to prepare ourselves intelligently to cope with this new problem, we must acknowledge certain basic principles.

World trade cannot be rebuilt simply by attempting to restore *prewar* flows of goods. The war has so completely changed the economic fiber of many countries that it is necessary to develop *new* trade relationships. The East Indies, for example, may find the demand for their rubber considerably reduced; the United States may, to a large extent, have to cease exporting cotton; Japan will need to find new substitutes for much of its exports of silk; the British will need new markets to replace the income which they formerly derived from their large overseas investments.

We cannot expand markets for our goods, at home or abroad, unless we find ways of buying more supplies from more people at home or abroad, so that they will have more dollars to spend.

And we probably cannot create increasing buying power abroad without first exporting more of our technical skills—our engineers, our production and management men—to build new markets for our own specialties.

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What is needed to rebuild the world's economic system?

1. Most basic of all, of course, are stable governments which command popular support. In the absence of strong governments, currency stability cannot be achieved.

2. Most war-stricken countries, for a year or two, will need rehabilitation loans, because they will require far more raw materials, equipment, and live stock than they can pay for out of current production.

3. Loans, however, are only a stop-gap, though often a necessary one. Far more important than rehabilitation loans will be the creation of better opportunities for war-stricken countries to sell to the rest of the world, particularly to the United States, South America, South Africa, and India. The ravages of war do not completely destroy the ability of a country to sell. Indeed, it is surprising what large supplies of certain commodities war-torn countries have on hand even before devastated industries have been restored. The invading troops in Normandy found shoes almost non-existent, but they found food more plentiful than in Britain.

   Better opportunities for war-stricken countries to sell would create opportunities for them to buy the things they will require to restore scattered industries and depleted farms, and would help those countries to get rid of the exchange controls which are now universal. So long as a country is able to expand its exports only slowly and painfully, and is dependent upon foreign loans to prevent the depreciation of its currency, so long will it carefully preserve exchange controls and other restrictions in imports. That is why large advances, either through an International Monetary Fund or an International Investment Bank, can make only limited contribution to the removal of trade restrictions.

4. Permanent monetary and credit arrangements are needed to protect nations against temporary pressure upon their currencies, to permit necessary changes in exchange rates to be made in an orderly manner, and to assure that governments never again will repeat the "beggar-my-neighbor" policies of 1931 and 1932.

5. Finally, the world needs a reversal of the trend toward economic self-sufficiency, which received a strong impetus from the first World War and an even stronger one from the great depression of the Thirties. This does not mean that the efforts of many raw-material producing countries to diversify their industries should be opposed. During the late Nineteenth Century and the first part of

this century, the international specialization of production was carried too far, with the result that many countries became dependent for a large part of their standard of living upon the export of one or two raw materials—coffee, sugar, rubber, silk, wheat, wool, and meat. Between the two World Wars, however, the pendulum swung much too far in the direction of self-sufficiency. Some densely populated industrial countries of Europe (Italy, France, and Germany) even attempted to become self-sufficient in wheat, fats, and sugar. So limited are the natural resources and technical skills of most countries that each one finds many things which it can produce only at prohibitive costs. Between the extreme specialization of the late Nineteenth Century and the more recent trend toward extreme self-sufficiency, a happy medium should be sought.

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What role should the United States play in reconstructing the world's international economic system?

There are those who suggest that the United States be a more or less permanent Santa Claus. They believe that an excess of exports could be financed only by "loans"—loans that would eventually turn into gifts, after producing bitter controversy over why the "debtor" country did not meet its obligations. The persons who assert that full employment can be provided only by an excess of exports are in effect saying that our economy cannot become self-supporting. That is a confession of economic defeatism which a young and vigorous nation should not be willing to make.

The most immediate contribution which the United States can make to world reconstruction is to make itself prosperous.

Prosperity here means a large demand by our industries for imports. The more we import, the easier will it be for foreign countries to meet their large and urgent needs for goods. In 1939, with a gross national product of $100 billion, our imports were $3 billion. After the war, with 55 million people employed and a gross national product of $155 billion, our imports would be about $7 billion or $8 billion.

Not only should the United States make itself prosperous, but it should *keep* itself prosperous. *So important is the United States in the world economy that a depression here is bound to produce a disastrous drop in the price of raw materials throughout the world and to throw most countries into an economic tailspin.*

The United States should support the principle of a large fund to protect the exchanges of the world from temporary pressure. We should not permit differences over the details to prevent its establishment in ample time to be available during the critical period when war-stricken countries will need goods far in excess of their immediate ability to pay for them. *Some* arrangement, even though imperfect in details, will be infinitely superior to no arrangement.

Finally, the United States should take the lead in breaking down barriers to trade. We are the logical country to do this, partly because of our immense domestic market, and partly because for most of the last twenty-five years this country has been able to sell other countries more goods than they have been able to sell to us. One of the greatest contributions which the United States could make to a sound and expanding world economy would be to bring our imports, as soon as practicable, up to our exports. *In other words, the United States, in the long run, should be hard to borrow from but easy to sell to.* The United States should implement this policy (1) by continuing the negotiation of reciprocal reductions in duty, and (2) by accepting exchange rates which make foreign currencies cheaper in dollars than they were in 1939. So great will be the world's need for goods that we can be sure that any dollar exchange earned by sales to us will be converted into American-made goods and will lead to larger exports.

Time was when the United States obtained about eight per cent of its standard of living by sending goods abroad and bringing back other goods. Before the war, however, we were getting less than five per cent of our living by international trade. If, after the war, we were gradually to raise the proportion of our standard of living obtained by trading with other countries to ten per cent of domestic production, our imports would be about $15 billion or $16 billion a year. Our people would be able to buy many things which they now cannot afford, and scores of countries which export raw materials and luxury products would feel the stimulus of rapidly expanding markets. Their expanded demand for road building machinery, mining machinery, machine tools, agricultural implements, locomotives, railroad cars, electrical equipment, trucks, automobiles, and a multitude of products of our factories would create a million or more additional jobs in our factories.

Although the United States would raise its standard of living by increasing its imports and its exports, it should honestly face the fact that the resulting shifts in production and employment would temporarily be painful for some people. The increase in imports would be in commodities which other countries can produce for less than the cost at which much of our output is produced—such as sugar, wool, copper, some fats and oils, wines, winter vegetables and fruits. The increase in our exports would come from those industries in which our superiority is greatest—particularly the manufacturing industries. Finally it would be advantageous, to the country as a whole, to shift a million or two workers from agriculture, where they earn about 60 cents an hour at best, to manufacturing, where they earn better than 80 cents an hour.

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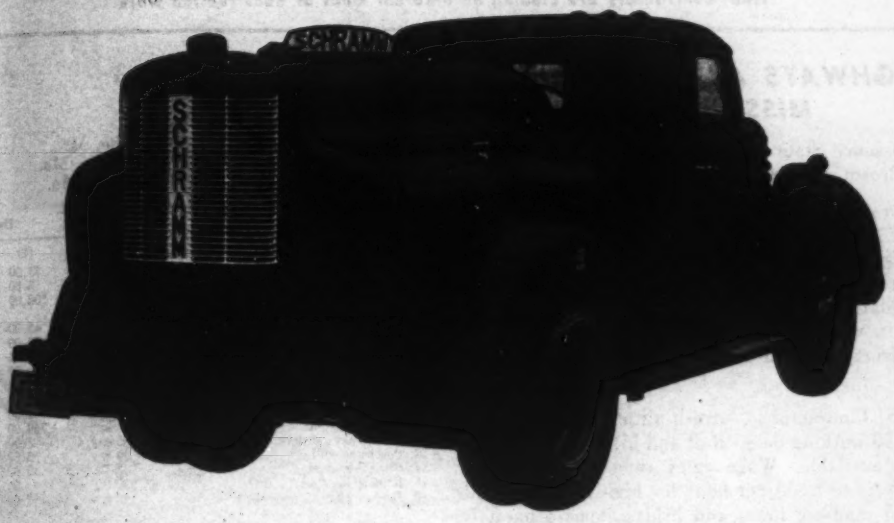
The very fact that in economic matters the rest of the world is dependent upon the United States, exposes our country to great demands and to envy and misunderstanding. The United States must be willing to help the rest of the world, but its help should take the form of assisting other countries to help themselves. Never in all history has one country had such an opportunity to give the world a rising standard of living, to foster conditions under which peace flourishes. What greater tragedy could there be than to make the sacrifices which we are now making and fail to seize this chance to create a world of hope and opportunity in which the spirit of goodwill among nations is able to flourish.

President McGraw-Hill Publishing Company, Inc.



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CONTRACT UNIT PRICES

What contractors are bidding on different kinds of construction work

HIGHWAYS AND BRIDGES
MISSOURI

OWNER: Missouri State Highway Commission, Jefferson City; C. W. Brown, chief engineer.

PROJECT: Grading, excavation, culverts, bridges and concrete paving 0.712 miles of Route 40-TR in St. Louis County, near St. Louis city limits. Bridges are reinforced concrete structures located at Stations 960+13.88 and 2+06.51. Highway is dual lane Portland cement concrete pavement, each lane 24-ft. wide. Contractor was allowed alternate on cross-road culvert pipe and overall low bid was on basis of concrete pipe.

CONDITIONS: Contractor to furnish all materials and complete work in 90 working days. Rail and highway transportation facilities available. Wage rates range from 45c. for unskilled workers to $2.00 per hour for highly skilled. Bids were asked on roadway items and bridge items separately, and in combination. Award made to low bidder on the combination.

BIDS: Five bids were received July 7, 1944, on the roadway items ranging from $127,982 to $163,104. On the bridge items they ranged from $105,590 to $131,457. On the combination, the basis of the award, they ranged from $244,842 to $294,561.

LIST OF BIDDERS (Combined roadway and bridge items)

1. Israel Brothers, Clayton, Mo. (contract) $244,842
2. Atkinson Windle Co., Inc., Chillicothe, Mo. 248,400
3. Massman Constr. Co., Kansas City, Mo. 274,956
4. R. B. Potashnick, Cape Girardeau, Mo. 275,045
5. Samuel Kraus Co., St. Louis, Mo. 294,561

Roadwork

LIST OF BIDDERS:

1. Atkinson Windle Co., Inc., Chillicothe, Mo. $127,982
2. Israel Brothers, Clayton, Mo. 139,252
3. R. B. Potashnick, Cape Girardeau, Mo. 149,345
4. Massman Constr. Co., Kansas City, Mo. 154,538
5. Samuel Kraus Co., St. Louis, Mo. 163,104

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Class A excavation	27,505 c. y.	$0.48	$0.60	$0.55
2. Class 3 excavation (structures)	573 c. y.	4.00	3.00	4.00
3. Compacting embankment (rolling)	30,588 c. y.	.07	.20	.15
4. Compacting in cuts (rolling)	2,040 c. y.	.40	1.00	.15
5. Overhaul	9,520 ¼-mi. y.	.06	.10	.20
6. Removing pavement	133 s. y.	1.00	1.00	1.50
7. Removing 6-in. curb	147 l. f.	.75	1.00	1.00
8. Remove guard fence	400 l. f.	.25	.20	1.00
9. Broken stone (aggr. bkfill.)	1,165 c. y.	4.00	3.50	4.00
10. Screenings (aggr. bkfill.)	649 ton	3.00	2.25	3.00
11. Water (compacting, rolling)	5,873 hund.gal.	.02	.10	.50
12. Gravel or cr. stone surf.	4 ton	4.00	3.00	5.00
13. Plain cement concrete pavement	29,288.7 s. y.	3.00	3.25	3.50
14. Cl. B concrete (other than box. culv.)	25.8 c. y.	60.00	60.00	50.00
15. 12-in. culvert pipe (X-road)	544 l. f.	1.75*	1.50†	1.75†
16. 15-in. culvert pipe (X-road)	108 l. f.	2.50*	2.00†	2.25†
17. 12-in. rein. conc. culv. pipe	326 l. f.	1.75	1.75	2.00
18. 18-in. rein. conc. culv. pipe	48 l. f.	2.75	3.50	4.00
19. Reinforcing steel	3,020 lb.	.07	.07	.10
20. Cl. A, type 1 or 3, underdrains	336 l. f.	2.50	2.50	2.00
21. Concrete protection curb	441.3 l. f.	3.50	3.50	5.00
22. 24-in. cobblestone gutter	150 l. f.	2.50	1.90	3.00
23. Cobblestone gutter	40 s. y.	5.00	3.75	5.00
24. 4-in. plain conc. sidewalk	399.7 s. y.	3.00	2.70	3.00
25. Relocating barricades	1 ea.	60.00	25.00	50.00
26. Steel grates and bearing plates	12,000 lb.	.20	.17	.20
27. Water, waterbnd. macad. base crse.	22 hund. gal.	.75	1.30	1.00
28. Coarse stone, waterbnd. mac. base crse.	68 ton	5.00	2.85	4.00
29. Screenings for base course	35 ton	5.00	2.90	4.00
30. Manipulation and finishing	273 s. y.	.50	.60	2.00
31. Bitum. mat'l., penet. macad. surf.	490 gal.	.25	.18	.60
32. Coarse aggregate, penet. macad. surf.	24 ton	5.00	2.90	4.00
33. Seal coat aggregate, pen. mac. surf.	7 ton	5.00	3.00	4.00

*Vitrified clay pipe. †Concrete pipe.

Bridges

LIST OF BIDDERS:

1. Israel Brothers, Clayton, Mo. $105,590
2. Atkinson Windle Co., Chillicothe, Mo. 120,410
3. Massman Constr. Co., Kansas City, Mo. 120,410
4. R. B. Potashnick, Cape Girardeau, Mo. 125,700
5. Samuel Kraus Co., St. Louis, Mo. 131,457

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Class 1 excav. for structures	1,390 c. y.	$3.00	$3.75	$2.75
2. Porous backfill	300 c. y.	3.50	4.00	4.00
3. Class B concrete (handrail)	31.8 c. y.	100.00	46.00	46.00
4. Class B conc. (superstr., excl. handrail)	566.7 c. y.	45.00	42.85	42.85
5. Class B conc. (substructure)	718.6 c. y.	32.00	42.35	42.35
6. Fabr. structural steel (bearing plates)	13,330 lb.	.25	.3272	.3272
7. Fabr. wrought iron (scuppers)	360 lb.	.70	.90	.90
8. Reinforcing steel	188,000 lb.	.07	.0671	.0671
9. 8-in. perf. vitr. clay pipe	280 l. f.	2.00	1.55	1.55
10. 8-in. vitr. clay sewer pipe	35 l. f.	1.50	1.15	1.15
11. Conduit system	Lump Sum	750.00	738.00	738.00
12. Cl. 1 excav., structures	1,485 c. y.	3.00	3.25	3.25
13. Porous backfill	49 c. y.	3.50	4.00	4.00
14. Class B concrete	673.7 c. y.	32.00	41.65	41.65
15. Reinforcing steel	83,550 lb.	.06	.07	.07
16. Replace channel revetment	128 s. y.	2.00	5.50	5.50

OUTLET SHAFT, ETC.,
CALIFORNIA

OWNER: Public Utilities Comn., San Francisco Water Dept., N. A. Eckart, gen. mgr. and chief engr.

PROJECT: Construction of outlet shaft and adits along with partial control works for drawing water from lake, located on east shore of San Andreas Reservoir, approximately two miles west of Millbrae, San Mateo County, Calif. Includes construction of reinforced concrete-lined shaft 14-ft. in diameter and 66-ft. deep, in which are two control valves and two concrete-lined adits. Adits extend from shaft to lake at one point. Open-cut excavation serves as inlet channel from lake to adits to traverse earthquake fault-line.

CONDITIONS: Owner to furnish 48-in. gate valves. Contractor to furnish balance of material, some of which has been salvaged. Portion of work must be done while lake level is down. Work was put underway, but now unable to proceed without further priorities. Time for completion was stipulated originally as six months. Highway transportation facilities available. Wage rates are: carpenters, $1.50 per hour; steam shovel operators, $2.00; tractor operators, $1.62½; machinists, $1.53.

BIDS: Six bids were received July 11, 1944, ranging from the contract low of $113,780 to $187,405. Engineers estimate $136,250.

PARTIAL LIST OF BIDDERS:

1. T. E. Connolly, San Francisco, Calif. (contract) $113,780
2. R. G. Clifford & Peter Sorensen, Redwood City, Calif. 125,907
3. Utah Construction Co., San Francisco, Calif. 142,690

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Excav. in open cut, unclassified	40,000 c. y.	$0.70	$1.43	$1.20
2. Excav. for shaft, unclassified	800 c. y.	20.00	14.00	20.00
3. Excav. for tunnel sections of adits, unclassified	550 c. y.	14.00	15.00	17.00
4. Concrete for shaft	450 c. y.	27.00	17.65	24.00
5. Concrete for floors and tunnel sections	90 c. y.	12.00	19.10	24.00
6. Conc. for sides and arches, tunnel sect.	290 c. y.	24.00	27.00	40.00
7. Conc. for struct. in open cut constr.	270 c. y.	30.00	30.00	40.00
8. Extra cement	50 bbl.	2.00	3.00	3.00
9. Reinforcing steel	46,000 lb.	.07	.075	.10
10. Furn. and install grout pipes for pressure grouting	110 ea.	2.00	3.00	4.00
11. Pressure grouting	800 c. f.	2.00	2.00	2.50
12. Steel castings	11,000 lb.	.40	.25	.35
13. Miscellaneous metal work	5,500 lb.	.50	.25	.35
14. Install gate valves (furn. by City)	30,000 lb.	.02	.04	.05
15. Construct timber roof for shaft	Lump Sum	400.00	600.00	800.00
16. Furn. and install intake screens	41,000 lb.	.50	.30	.35

IN MATERIALS as well as in men, the test of character is not how they meet the ordinary requirements but how they stand up under stress and strain.

Thermoid Products are widely employed on nearly every kind of construction job. But we are especially proud that so many contractors insist on their use on the tough ones!

Thermoid Hose (air, water, suction and steam), Thermoid Conveyor Belting, Industrial Brake Linings are built to meet unusual conditions—and experience proves that they do!

Learn to "rely on Thermoid". Our products' reputation for outstanding service has been earned the hard way—*on the tough jobs!*

THE THERMOID LINE INCLUDES: Transmission Belting • F. H. P. and Multiple V-Belts and Drives • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose • Sheet Packings • Industrial Brake Linings and Friction Products • Molded Hard Rubber and Plastic Products

Thermoid Rubber

It's good business to do business with Thermoid

MATERIALS AND LABOR PRICES

Market quotations on construction materials and wage rates reported monthly by ENR correspondents

CONSTRUCTION MATERIAL prices and labor rates for September show only minor changes from the preceding month. Short-leaf Southern pine is off $5.00 per M f.b.m. on the 2x4-in. size in Atlanta, but up $1.00 on 1-in. boards in St. Louis.

An OPA-authorized increase of 3% on roofing supplies had the effect of raising these prices in New York and Minneapolis. Asphalt coating and tar pitch are up in St. Louis. Concrete block prices are higher in St. Louis, both on sand and gravel block, and on lightweight aggregate block. Lightweight block is off 1c. in Cleveland. All other prices remain unchanged from August.

The Baltimore, carpenters' rate is up 6½c. from August, the new rate reading $1.4375 per hour. The range on hoisting engineers' rate in Baltimore widened from $1.625-$1.80 to $1.625-$2.00. Detroit common building labor scarcity raised the rate there from a straight 90c. per hour to one ranging from 90c. to $1.00.

CEMENT, AGGREGATE, READY-MIXED CONCRETE—F.O.B. CITY

	PORTLAND CEMENT—Per bbl., C/L lots, incl. 40c. per bbl. for bags, cash dis. not deducted: Cloth *a*	Paper	Bulk	SAND AND GRAVEL—Per ton, carload lots: Gravel, 1½ in.	Gravel, ¾ in.	Sand	CRUSHED STONE—Per ton, carload lots: 1½ in.	¾ in.	CRUSHED SLAG—Per ton, carload lots, f.o.b. plant: 1½ in.	¾ in.	CONCRETE BLOCK 8x8x16-in.; truckload del.; per block: Sand-grav.	Lt.wgt. Agg.	CONCRETE Ready Mixed 1:2:4, cu. yd. 5½ sk., 6
Atlanta	$2.77	$2.52	$2.47	$1.70	$1.80	$1.90	$1.70	$1.80	$1.50	$1.60	$0.17	....	$8.00
Baltimore	2.53	2.28	2.03	1.75‡	1.75‡	1.25‡	1.75‡	1.75‡	1.75‡	1.75‡	.125	$0.125*w*	7.35
Birmingham	2.50	2.25	2.10	1.75	1.75	1.50	.85	1.00	.90	1.15	.1425	....	6.80
Boston	2.97*b*	2.72*b*	2.52	1.50‡	1.50‡	1.05‡	1.25‡	1.35‡	....	....	.13	.155*w*	7.15
Chicago	2.70	2.45	2.30	2.15‡*d*	2.15‡*d*	2.15‡*d*	2.15‡*d*	2.15‡*d*	1.75‡	1.75‡	.16	.16*x*	....
Cincinnati	2.31	2.06	1.81	1.20	1.20*dd*	1.10*dd*	1.80	1.80	....	....	.12	.15*w*	6.60
Cleveland	2.39	2.14	....	1.75*i*	1.75*i*	1.55*i*	1.80*i*	1.80*i*	1.73*i*	1.73*i*	.14	.14	7.30
Dallas	2.52	2.27	2.07	1.50*p*	1.70*p*	1.10*p*	1.60*p*	1.79*p*	....	....	.15	....	6.20
Denver	3.08	2.88	2.32	1.20	1.30	1.25	1.65	1.75	1.00	1.00	.15	....	7.25
Detroit	2.30	2.14	1.99	1.50	1.50	1.50	2.25	2.25	2.00‡	2.00‡	.13	.14*w*	7.00
Kansas City	2.58	2.33	2.18	1.85	2.30	1.00	1.91	1.91	....	....	.125	.125*uy*	7.80
Los Angeles	3.00*v*	2.40*v*	....	1.30	1.30	1.15	1.30*f*	1.30*f*	....	....	.04½*b*	.10*aa*	7.25
Minneapolis	2.90	2.65	....	1.00*h*	1.00*h*	.25*h*	1.00*h*	1.00*h*	....	....	.12	.16	7.10
Montreal	....	1.95*rs*	1.79*rs*	1.65‡*s*	1.65‡*s*	1.50*t*	.80*ct*	.90*ct*	....	....	.14*t*	.14*ut*	7.25
New Orleans	2.41	2.16	1.96	1.65	1.65	.90	....	....	....	....	.19	....	9.25
New York	2.89‡	2.64‡	....	1.60*de*	1.60*de*	.90*de*	1.70*de*	1.80*de*	....	....	.16	.14*vcc*	7.75
Philadelphia	2.73	2.48	2.28	1.55‡	1.65‡	1.20‡	1.90	1.95	1.10	1.10	.155	.155*w*	8.45
Pittsburgh	2.45	2.20	2.00	1.65‡	1.65‡	1.35*dd*‡	2.25‡	2.25‡	1.50	1.50	.17	.17*s*	8.25
St. Louis	2.80	2.52	....	1.75‡	1.75‡	1.25/1.50‡	1.10*h*	1.10*h*	.75*g*	.75*g*	.145	.13*w*	8.00
San Francisco	....*u*	2.21	1.91	1.36	1.36	1.36	1.46	1.46	....	....	....	.20*y*	7.55
Seattle	2.95*o*	2.75*o*	....	1.00*o*	1.00*o*	1.00*o*	2.00*o*	2.00*o*	....	....	.16	.16*y*	7.25

‡ Delivered. *a* 10c. allowed for each returnable bag. *b* 10c. per bbl. off for cash. *c* F.o.b. quarry. *d* Per cu. yd. *e* Barge lots alongside docks. *f* Crushed granite. *g* F.o.b. Granite City, Ill. *h* F.o.b. plant. *i* Within three miles of Public Square. *j* 5% discount for cash. *k* Discount of 2 percent for cash in 10 days. *l* Up to 200 cu. yd. *m* 50c. off for cash. *n* 25 c.y. or more. *o* 2% off for cash. *p* 10c. per ton off, cash 15 days. *r* 10c. per bbl. off, cash 20 days. *s* 8% sales tax included. *t* 8% sales tax not included. *u* Price withdrawn. *v* 20c. per bbl. discount; 20c. allowed for returnable cloth bag. *w* Cinder. *x* Waylite. *y* Haydite. *z* Celocrete. *aa* Pumice. *bb* 4 x 8 x 12 in. *cc* Also 8 x 18 x 18 in. *dd* Corrected price; also applies for July.

CASH DISCOUNTS CEMENT to Contractors: truck delivery, 2% for cash on 10th of month; on carload deliveries, no trucking, same as dealer cash discount 10c. per bbl. for payment within 15 days of date of invoice. Subject discount 10c. per bbl. 20 days in Montreal.

CURRENT MAXIMUM PRICE BASES AT CEMENT MILL

Charge for bags not included. For cloth bags, add 40c. per bbl.; 10c. refund allowed for each returnable bag; for paper bags add 15c. per bbl., not refundable.

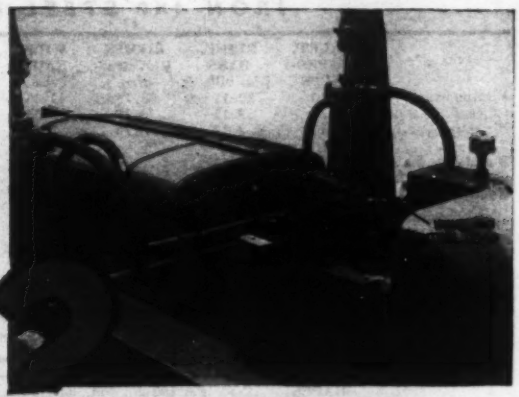
	Bagged	Bulk		Bagged	Bulk		Bagged	Bulk
Buffington, Ind.	$1.70	$1.65	Ironton, Ohio	$1.60	$1.55	Richard City, Tenn.	$1.80	$1.75
Dallas, Tex.	....	....	Limedale, Ind.	....	....	Steelton, Minn.	1.80	1.75
Hannibal, Mo.	1.70	1.65	Norfolk, Va.	....	....	Universal, Pa.	1.65	1.60
Hudson, N. Y.	....	....	Northampton, Pa.	1.75	1.70	Waco, Tex. (Plus 9c. tax in Tex.)	1.75	1.70
Independence, Kans.	1.70	1.65	North Birmingham, Ala.	....	....	Montreal (8% sales tax incl.)	1.68	1.67
						Discount 10c. per bbl. 20 days		

PAVING BRICK, BLOCK, ASPHALT, ROAD OILS—F.O.B. CITY

	PAVING BRICK AND BLOCK: Granite per M. lots of 50,000 4x4x8 in.	Brick per M 3x4x8½ in. carload lots	Wood per sq. yd. 3½ in. 16-lb. treat	PAVING ASPHALT: Per ton, less than 80 penetration: Tank car	Drums	ASPHALT BINDERS—FLUXES: Per gal., 80-300 penetration: Tank car	Drums	CUTBACK ASPHALT: Per ton: Tank car	Drums	ROAD OIL: Per gal.: Tank car	ASPHALT EMULSION (Quick-breaking) Per gal.: Tank car	Drums
Atlanta	$73.00	$39.35	$2.25	$18.53*e*	$24.62*e*	$0.0740*e*	$0.1309*e*	$0.0802*he*	$0.1348*h*	$0.0676*e*	$0.0826	$0.1204
Baltimore	150.00‡	49.00	82.50*m*	15.00*r*	21.00*r*	.06*r*	.09*r*	13.00*r*	23.00*r*	.065*r*	.07*r*	.1*r*
Birmingham	150.00	48.00	.....	17.95	.....†	.0747	.....†	.0834*h*	.....†	.065	.09	.....
Boston	85.00	59.00	3.75	17.00	24.00	.20	.22	25.00	30.00	.....	.1125	.125
Chicago	150.00	55.00	2.50/2.80*d*	14.00	22.50	13.00*g*	21.60*g*	.0575*h*	.15*h*	.05*n*	.09/10*n*	.13/.15*n*
Cincinnati	120.00	50.00	.....	16.40	.....	.085	.....	12.25	.....	.07	.085	.....
Cleveland	118.00	37.25	2.50	16.00	18.00	.085	.095	.10*h*	.....	.095	.095	.....
Dallas	.....	36.00	.....	13.65	20.30	.06	.11	16.00	24.80	.06	.05/.07	.07/.09
Denver	.....	16.11	.....	11.00	.....	10.00	.....	.045*h*	.....	.....	.....	.....
Detroit	.....	37.00	.....	18.06*f*	25.60*f*	.0743	.128	.0718*h*	.119*h*	.067	.0775	.1140
Kansas City	.....	40.00	.....	18.50	23.50	.077	.1075	.077*h*	.107*h*	.057	.11	.15
Los Angeles	.....	50.00	.....	9.00*b*	23.00	9.50*bg*	24.00*bg*	9.50*b*	.....	.025	.072	.15
Minneapolis	.....	.....	2.30*d*	.....	27.70	.....	.126	.....	32.64	.....	.....	.....
Montreal	93.40	.....	.....	16.60*k*	24.25*k*	.116*k*	.1485*k*	.115*hk*	.1354*k*	.084*k*	.1354	.1854
New Orleans	.....	.....	.....	13.50*a*	20.00*a*	.057	.088	.06*h*	.095*h*	.....	.080	.....
New York	.....	65.00	.....	17.40	24.20*p*	14.00	.....	.0725*h*	.1325*hp*	.....	.0725*p*	.1125*p*
Philadelphia	140.00	58.00	4.06	15.00*r*	.....	14.00*r*	.....	.065*hr*	.....	.....	14.00*rr*	.....
Pittsburgh	135.00	38.75	.....	18.00	23.00	.09	.16	20.00	36.00	.07	.06	.11
St. Louis	.....	37.00	.....	16.00	22.00	15.00*g*	21.00*g*	.0575*h*	.1212*h*	.648	.06	.11
San Francisco	.....	40.00	.....	10.90	21.15	10.90*g*	18.00*gr*	12.90	17.50*r*	9.50*gr*	.0525	.1125
Seattle	.....	60.00*o*	.....	10.90*i*	23.40*i*	.....	20.40*gi*	11.40*i*	.....	.....	.0525*i*	.0825

‡ Delivered. *a* F.o.b. Baton Rouge. *b* Delivered to purchaser's warehouse. *c* 3½x4x8½ in. *d* 2½ in. 12-lb. treatment. *e* Local reduction due to 20% reduction intra-state class freight rates, only Georgia affected. *f* Mexican. *g* Per ton. *h* Per gallon. *i* F.o.b. Martines. *j* 3x3½x8½ in. *k* Tax included. *n* Per thousand. † Available on priority only and quoted specially. *p* No steel drums; shipments except to armed forces. *r* February 1943 prices, none later available.

Ever Operate a BAKER?



you did, we need not tell you how simple is. We've been talking about direct hydraulic lift and full down pressure on the blade and about the ease and low cost of maintaining Baker bulldozers and gradebuilders. But, as a contractor who operates ve Bakers pointed out to George Phares, ur No. 1 field man—"Baker's ease of control is something to write home about."

Operator faces forward—no need to sit skew. Control lever is within convenient each. Four lever positions—*float, down, old, raise.* Fast, positive action. That *hold* important—you can put the blade in a ut and hold it there! On many occasions, specially where the going is tough, hydraulic down pressure is the operator's "ace the hole."

Baker Bulldozers on Allis-Chalmers -cycle diesel tractors are making it easier or our fighting forces on every front.

THE BAKER MFG. CO.
567 Stanford Ave., Springfield, Ill.
"If it concerns Victory, it concerns us"

Top: Baker Bulldozer on Allis-Chalmers tractor clears floor of pit for buried fuel tank in South Pacific.

Bottom: Private Wally Saner, former Baker employee, removing snow at Alaska air base with Baker Gradebuilder which helped build base.

BULLDOZERS SNOW PLOWS **BAKER** CONSTRUCTION EQUIPMENT

IRON AND STEEL PRODUCTS—BASE MILL PRICES

	STRUCT. SHAPES-PLATE	REINF. BARS ¼-in. billet *b*	RIVETS ½-in. structural	WIRE NAILS Base *d*	SHEET PILING Base	STEEL RAILS Per Gross Ton Standard	Light	Re-rolled	Angle Bars	TRACK SUPPLIES Std. Spikes *e*	Tie Plates *e*	Track Bolts
Birmingham	$2.10	$2.15	$3.75	$2.55	.....	$40.00	$40.00	$39.00	$2.70	$3.00	$2.15	$4.75
Chicago	2.10	2.15	3.75	2.55	$2.40	40.00	40.00	39.00	2.70	3.00	2.15	4.75
Pittsburgh	2.10	2.15	3.75	2.55	2.40	40.00	40.00	39.00	2.70	3.00	2.15	4.75
Buffalo	2.10	2.15	.....	.....	2.40	.....	.....	.....	.....	.....	2.15	.....
Cleveland	2.10	2.15	3.75	2.55	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown	.....	2.15	.....	.....	.....	.....	.....	.....	.....	3.00	.....	.....
Detroit	.....	2.27‡	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gulf ports	2.47*a*	2.52*a*	.....	.....	2.85*a*	.....	.....	.....	.....	.....	.....	.....
Pacific ports	2.75*a*	2.80*a*	.....	3.05	2.95*a*	.....	.....	.....	.....	.....	2.30	.....

‡ Delivered. *a* F.o.b. cars dock. *b* Rail steel same as billet prices. *c* Other basing points include Portsmouth, O., Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., and Pacific coast ports, on tie plates alone, Steelton, Pa., spikes alone, Lebanon, Pa., Richmond, Va. *d* Add switching charge $18 per

IRON AND STEEL PRODUCTS—F.O.B. WAREHOUSE, PER 100 LB., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb. base price	REINFORCING BARS* Per 100 lb., ¼ in., base price 15 tons or over *b* New billet	Rail steel	Add Switch	$/cwt. for Del.	EXPANDED METAL LATH Per 100 sq. yd., carload lots Std. diamond mesh, 3.4 lb.	Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING— Per 100 sq. yd., carload lots 4x16 in., No. 5 & 10 wires	4x12 in., No. 8 & 12 wires	6x6 in. No. 6 & 6 wires Per sq. yd.	SHEET PILING Per 100 lb. base price
Atlanta	$2.34	$2.40	$2.40	$.02½	$.10	$21.06	$23.00	$1.82	$1.35	$0.1719	$3.04
Baltimore	3.70	2.90	2.75	.....	.10	22.50	24.50	1.70	1.27	.1611	3.09
Birmingham	2.10*a*	2.15	2.15	.02½	.10	19.00	21.00	1.80	1.34	.1701	.....
Boston	3.912	3.994	....	$20 C.L.	.10	18.50	29.50	1.76	1.31	.1656	2.77
Chicago	2.10*a*	2.15	2.15	.03	.05	21.50	23.50	1.67	1.25	.1575	2.40
Cincinnati	3.68	2.53*ed*	2.53*ed*	.....	.05	19.50	21.50	1.66	1.25	.1566	.....
Cleveland	2.10*a*	2.15	2.15	.02½	.10	19.50	21.00	1.66	1.25	.1566	.....
Dallas	4.25	3.17	3.17	.....	....	25.00	27.50	1.93	1.42	.1827	.....
Denver	4.57	3.33*kl*	....	.....	....	26.50	26.50	1.97	1.45	.186	.....
Detroit	3.65‡	2.52‡	2.52‡	.....	.10	30.00	30.00	1.68	1.26	.1584	2.66
Kansas City	4.19	2.61*ed*	2.61*ed*	.0	.05	24.50	26.50	1.78	1.33	.1683	2.874
Los Angeles	3.65*f*	2.575	2.425	.02½	.05	23.00	27.50	1.93	1.42	.1827	3.65
Minneapolis	3.81‡	2.73	2.73	.0	.10	25.00	27.00	1.80	1.34	.1701	2.73*d*
Montreal	3.95*i*	2.90*i*	2.80*i*	.....	....	26.00*kij*	33.00*kij*	2.25*i*	3.14*i*	.228*i*	.....
New Orleans	4.229‡*k*	2.52	2.52	.05	.10	19.00	21.00	1.82	1.35	.1715	2.875
New York	3.75	2.76*c*	2.76*c*	.....	.15	17.50	19.50	1.76	1.32	.1665	2.74
Philadelphia	3.66	3.67	....	.....	....	19.50	21.50	1.71	1.28	.1611	2.72
Pittsburgh	2.10*a*	2.15	2.15	.02½	.10	23.00	26.50	1.59	1.20	.1503	2.40
St. Louis	3.697	2.74	2.74	.0	.05	28.00	34.00	1.69	1.27	.1602	2.70
San Francisco	4.35	2.825	2.675	.02½	.10	21.00	24.50	1.93	1.42	.1827	3.65
Seattle	2.75*e*	2.80*e*	....	.....	....	34.50	38.50	1.93	1.42	.1827	2.95*d*

‡ Delivered. *a* Mill prices. *b* 5–15 tons, add 15c. 1–5 tons, add 25c. Less than 1 ton, add 50c. *c* 20 tons or over Base. *d* Mill price plus freight. *e* F.a.b. dock. *f* Includes delivery in free delivery zone. *g* Less than 1 ton, add 25c.; 1 to 5 tons, add 10c. * High scrap steel prices cut former 15c. differences between new billet and rail steel in many mills. *h* List price. *i* Plus Dominion and Province sales tax. *j* August 1942 price; not on market. *k* Quotation on changed basis; no actual price change. *l* Approximate Denver price out of wholesale stocks, based on Chicago area; not comparable with preceding prices.

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE Per net ton f.o.b. 6 in to 24 in.*a*	VITRIFIED SEWER PIPE Per foot, std. 8 in., s.s.	Delivered std. 12 in., s.s.	ASTM 24 in.,	C13–35 36 in.	CLAY DRAIN TILE Per 1,000 ft., carload lots, f.o.b. 6 in.	8 in.	CONCRETE SEWER PIPE Per ft., delivered; ASTM 12 in.	C 14–35 24 in.	WROUGHT STEEL PIPE Full standard weight, *h* 1 to 3 in., Black %	Butt Weld 3½ to 6 in.; Galv. %	Lap Weld Black %	Galv. %
Atlanta	$49.66	$0.26*b*	$0.468*bc*	$1.8525	$4.68*c*	$85.00	$128.00	$0.45	$1.642	48.2	54.2	59.7	51.2
Baltimore	53.00	.35	.60	2.70	7.25	160.00	200.00	.55	1.80	65.5	57.5	63.0	54.5
Birmingham	45.00	.275	.495	1.95	5.50	100.00	220.00	.50	1.70	62.2	54.2	59.7	51.2
Boston	55.40	.371*r*	.7155*r*	2.79*r*	7.6875*r*	155.00‡*r*	245.00‡*r*	.60	....	....	....	....	....
Chicago	54.33	.35	.675	2.70	7.00	100.00‡	150.00‡	.45	1.85	66.0	55.0	64.5	53.0
Cincinnati	53.27	.231	.4455	1.80	5.125	105.00‡*s*	170.00‡*s*	.75*t*	1.75*t*	57.1	43.4	54.0	39.6
Cleveland	54.75	.266*r*	.513*r*	2.115*r*	5.535*r*	90.60	139.40	.36	1.38	68.5	57.5	66.0	54.5
Dallas	56.43	.31	.58	2.25	5.00	90.00	110.00	.46	1.57	59.9	51.9	57.3	48.3
Denver	61.56	.29†	.52†	2.16†	3.00*n*	125.00	200.00	1.00	2.22	58.4	50.4	55.7	47.2
Detroit	54.75	.35	.675	2.70	7.75	135.00	200.00	.40	1.75	57.6	44.0	54.5	40.2
Kansas City	55.73	.315	.39	2.20	5.86	140.00	260.00	.45	1.60	35.9	46.4	46.6	39.0
Los Angeles	68.40	.282†	.508†	2.034†	5.085†	115.50	192.50	1.00	2.00	61.1	50.1	58.6	47.1
Minneapolis	57.47	.275†	.495†	1.98†	5.37†	.....	.....	.90	2.10	64.2	53.2	60.7	49.2
Montreal	67.00	.85*o*	1.50*o*	5.25*p*	8.50*ep*	45.00*m*	64.00*m*	.48*m*†	1.92*m*†	....	....	....	....
New Orleans	51.78	.26	.48	1.69	....	150.00	220.00	.45	1.65	62.4	54.4	58.8	50.3
New York	52.40	.308	.594	2.52	6.45	.....	.....	.60	1.40	64.9	53.9	62.4	50.9
Philadelphia	51.00	.335	.675	2.75	7.50	150.00	225.00	.45	1.75	56.6	42.8	53.6	39.1
Pittsburgh	56.00	.266†	.513†	2.295†	5.945	97.80	154.20	.85*q*	2.00*q*	68.5*i*	57.5*i*	66.0*i*	54.5*i*
St. Louis	53.62	.28	.504	2.016	4.50	85.00	220.00	1.25*j*	2.25*k*	56.4	42.6	52.5	38.4
San Francisco	68.40	.3625*d*	.6525*d*	2.61	6.52	115.00	192.50	.58	2.34	45.0	31.0	41.0	26.0
Seattle	70.20	.375	.675	2.70	6.75	84.00	187.50	.51*f*	1.44*f*	....	....	....	....

‡ Delivered. † F.o.b. *a* B. & S. class B and heavier, C/L lots, 200 tons and over Burlington, N. J. (base) $49.00. Based on existing freight rates; subject to rate change. Gas pipe and class A, $3 per ton additional, 4 in., $3 per ton additional, 30 in. and larger usually $2 per ton less. *b* Double strength. *c* List to dealer. *d* List. *e* 30-inch. *f* Less 5% for cash. *g* Culvert pipe. *h* Discounts from standard list consumers carload prices, except Pittsburgh prices are f.o.b. mill. Base price $200 per net ton. List prices per ft.: ½ in., 8½c.; ¾ in., 11½c.; 1 in., 17c.; 2 in., 37c.; 2½ in., 58½c.; 3 in., 76½c.; 4 in., $1.09; 6 in., $1.92. 3 per cent tax on transportation costs not included. *i* Applies also at Lorain, Ohio, mills. Chicago delivered base is 2½ points less on butt, 1½ on lap. Freight is figured from Pittsburgh, Lorain, O., Chicago Dist. Billing is from point producing lowest price at destination. WROUGHT IRON PIPE: Base prices and list prices per ft. same as wrought steel pipe. Discount for Pittsburgh base: Butt-weld—1 in. and 1¼ in. black 34, galv. 16; 1½ in. black 38, galv. 18½; 2 in. black 37½, galv. 18. Lapweld—2½ in. to 3½ in. black 31½, galv. 14½; 4½ in. to 8 in. black, 32½ galv. 17. *j* Reinforced; spec. C 76–37. *k* Reinforced; spec. C 75–37. *l* Plus sales tax. *m* Tax included. *n* 27-in. pipe. *o* Less 30%. *p* Less 53%. *r* Truck delivery. *s* Price quotations on delivered basis since May, 1940; current f.o.b. price $34 for 6 in.; $130 for 8 in. *t* Reinforced pipe prices since May, 1937; current plain pipe prices are: 12 in., 36c.; 24 in., $1.50.

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ALWAYS USE MOBILUBE GEAR OILS! These highly stable, straight mineral oils, developed especially for heavy-duty service, are much more efficient than older-type gear oils. Free of abrasives, soaps, fillers, all foreign materials. Keep scuffing and wear at a minimum . . . withstand long service. Mean fewer gear breakdowns — LESS TIME LOST FROM THE JOB! Get this protection now!

OTHER SOCONY-VACUUM TIME SAVERS:

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USE SOCONY-VACUUM FUELS, LUBRICANTS, AND ENGINEERING SERVICE!

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MOBILUBE *Gear Oil*

SOCONY-VACUUM OIL CO., INC., and Affiliates: Magnolia Petroleum Co., General Petroleum Corp. of Calif.

LUMBER, TIMBER PLYWOOD—PER M FT., B.M., CARLOAD LOTS F.O.B.

	SHORT LEAF YELLOW PINE AND DOUGLAS FIR — All S. L. Y. P. is No. 2 common or better end for No. 1 N. C. Box. (Prices in Bold Face) *All Fir planks No. 2 common, Fir timber is No. 1 common. Lengths up to 20 ft. (Prices in italics)*								LONG LEAF Y. P. Merchantable grade up to 20 ft.		PLYWOOD Rail freight increment (See note for base p
	1x6 S4S	1x8 S4S	2x4 S4S	2x6 S4S	2x8 S4S	2x10 S4S	3x12 S4S	6x12 S4S	12x12 S4S	2x12 S4S	12x12 S4S	¼"
Atlanta	$40.00	$40.00	$32.00	$35.00	$34.00	$37.00	$46.00	.....	.....	$57.00	$64.00	$17.90
Baltimore	44.00	46.00	44.00	46.00	47.00	52.00	65.00	.....	.....	115.00	120.00	18.25
	48.00	*49.00*	*55.00*	*55.00*	*55.00*	*57.50*	*68.00*	*$75.00*	*$75.00*	.....	.....	.....
Birmingham	45.00	45.00	44.50	43.50	44.50	47.50	68.00	55.00	55.00	.....	.....	17.35
	50.00	50.00	49.50	48.50	49.50	52.50	72.00	.....	.....	67.50	70.00	.....
Boston	60.00[a]	60.00[a]	60.00[a]	60.00[a]	60.00[a]	62.00[a]	66.00[a]	.....	.....	58.00[a]	58.00	18.25
	58.00	*58.00*	*54.00*	*54.00*	*54.00*	*54.00*	*58.00*	*58.00*	*58.00*	.....	.....	.....
Chicago	54.00	54.00	55.00	54.00	54.00	60.00	68.00	.....	.....	80.00[k]	95.00[k]	14.60
	58.00	*58.00*	*54.00*	*54.00*	*54.00*	*55.00*	*56.00*	*56.00*	*67.00*	.....	.....	.....
Cincinnati	47.50	49.00	42.50	42.50	43.50	44.50	67.00	.....	.....	65.00	65.00	17.35
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cleveland	42.50[k]	42.50[k]	52.50[k]	51.00[k]	65.00	65.00	83.00	83.00	83.00	.....	.....	17.75
Dallas	45.25	45.25	44.50	43.00	43.00	47.25	60.75	58.75	58.75	88.75	85.00	14.60
Denver[‡]	63.50[i]	62.00[i]	65.00[i]	65.00[i]	65.00[i]	66.00[i]	69.00[i]	*83.00*	*89.00*	.....	.....	10.45
Detroit	61.00	61.00	57.75	57.75	57.75	63.75	71.00	70.75	90.00	70.75	90.00	17.35
	57.00	*57.00*	*57.00*	*57.00*	*62.75*	*72.75*	*75.00*	*75.00*	*90.00*	.....	.....	.....
Kansas City	69.00	69.00	67.00	65.50	67.00	69.00	84.00	.....	.....	84.00	94.00	12.60
	66.00	*66.00*	*59.50*	*59.50*	*59.50*	*59.50*	*75.00*	*80.00*	*80.00*	.....	.....	.....
Los Angeles	60.00	60.00	60.50	60.75	59.25	59.25	72.75	72.00	72.00	.....	.....	9.90[h]
Minneapolis[‡b]	59.00[i]	59.00[i]	.....	.....	.....	.....	.....	.....	.....	.....	.....	12.60
[‡]	*56.50*	*64.75*	*57.00*	*57.25*	*58.25*	*67.00*	*61.50*	*59.75*	*59.75*	.....	.....	.....
Montreal[†]	58.00	61.00	54.00	58.00	60.00	66.00	.....	.....	.....	200.00	200.00	.....
	54.00	*54.00*	*57.00*	*57.00*	*57.00*	*58.75*	*62.00*	*62.00*	*62.00*	.....	.....	.....
New Orleans	40.00	40.00	37.00	35.00	34.00	36.00	46.00	.....	.....	55.00	69.00	14.60
	51.00	*51.00*	*53.00*	*51.00*	*54.00*	*52.00*	*53.00*	.....	.....	.....	.....	.....
New York	67.50	67.50	62.50	62.50	62.50	64.00	74.00	.....	.....	130.00[f]	125.00[f]	18.35
[‡]	.....	.....	*65.00[i]*	*65.00[i]*	*65.00[i]*	*65.00[i]*	[Range from $75 to $95]			.....	.....	.....
Philadelphia	75.00	75.00	75.00	75.00	75.00	75.00	75.00	.....	.....	130.00	130.00	18.25
	75.00	*75.00*	*75.00*	*75.00*	*75.00*	*75.00*	*85.00*	*90.00*	*90.00*	.....	.....	.....
Pittsburgh	50.80	53.20	62.75	55.00	60.85	62.50	76.25	.....	.....	.....	.....	18.10
	69.20	*68.10*	*66.10*	*66.50*	*68.20*	*68.65*	*88.75*	*88.75*	*88.75*	.....	.....	.....
St. Louis[‡c]	60.00	60.00	56.00	55.00	56.00	57.00	69.00	*75.00*	*75.00*	87.00	87.00	14.60
San Francisco[d]	*41.00*	*41.00*	*36.50*	*36.75*	*35.75*	*35.75*	*37.50*	*36.00*	*36.00*	.....	.....	7.30[g]
Seattle	*35.00*	*35.00*	*35.00*	*35.00*	*35.00*	*35.00*	*40.00*	*40.00*	*40.00*	.....	.....	0.00

Bold Face type, Southern Pine. *Italics, Douglas Fir.* [1] Long leaf. [2] Roofers, N. C. Pine. [3] Spruce. [4] Native. [5] Western Pine, No. 3 Common. [7] Spruce. [8] Norway Pine. ‡ Delivered. *b* Yard prices. *b* Contractors discount in Minneapolis and St. Paul discontinued May 21, 1938. *c* 5M ft. or less. *d* F.o.b. cars San Francisco freight rate. *e* 10% discount taken off. *f* Up to 18 ft. † Plus sales tax.

Note: Special concrete form grade Fir Plywood, 4' by 8' panels, 5-ply, sand 2 sides, water resistant glue, carload lots, delivered per 1,000 sq. ft. surfa Seattle base price on ½", $95.15; on ⅝", $104.85; price includes oiling and st ing charges. For other centers add rail freight increment from table or prop size. For resin dipped treatment, add $10.50 per M. *g* Lower rate by wat shipment. *h* 50,000 lb. minimum. *i* Ranges from $65 to $69. *j* Average pri *k* August 1943 price. *l* September price; none later available.

GLASS, EXPLOSIVES, CHEMICALS

	WINDOW GLASS Discounts from jobbers list, Aug. 15, 1938 Single or Double Thickness A quality	B quality	EXPLOSIVES Per lb, 40% Ammonia Gelatin in 50-lb. cases delivered in 200 lb. lots*	
Atlanta	75%	75%	$0.15	
Baltimore	78%	79%	.15	
Birmingham	76%	76%	.105	
Boston	77%	78%	.15	
Chicago	77%	77%	.15	
Cincinnati	77–10%	77–10%	.15	Price of 60% Ammonia Gelatin in $0.01 per lb. higher than 40%
Cleveland	77%	77%	.19	
Dallas	76%	76%	.1625	
Denver	76%	76%	.155*e*	
Detroit	77%	77%	.1575	
Kansas City	77–10%	77–10%	.155	
Los Angeles	86%*d*	88%*d*	.1575	
Minneapolis	77%	77%	.155	
Montreal	40–5%*ab*	47%*ae*	.1675†	
New Orleans	70%	75%	.16	
New York	81%	82%	.22*f*	
Philadelphia	78%	79%	.15	
Pittsburgh	79%	79%	.1225	
St. Louis	77–10%	77–10%	.155	
San Francisco	66%	73%	.155	
Seattle	75%	75%	.1575†	

a Discount from list Sept. 1939; sales tax included, but 6% tax exemption not allowed for. *b* Single thickness. *c* Double thickness. *d* Discount from jobbers' list Sept. 15, 1928.

* Urban prices influenced by service charges or local storage and delivery regulations, do not consistently reflect quantity prices in less congested areas. *e* F.o.b. Louviers, Colo. *f* In boroughs of Kings, Queens and Richmond, and in Manhattan south of Canal St. add delivery charge of $6.00 per trip. [1] F.o.b.

40% Ammonia Gelatin price ranges in other than urban areas, per lb. (except Seismograph Grades)

	C/L 20,000 lb. net	Tons	200 lb. lots
E. of the Miss., except Fla. and Me.	$0.105	$0.13	$0.15
W. of Miss. to Rocky Mtn. States, Fla. and Maine.	.11 –.1175	.135 –.1475	.155 –.1675
Rocky Mtn. States	.11 –.1225	.135 –.1525‡	.155 –.1725‡
Pacific N. W. States	.1075–.12	.1375–.15	.1575–.17
Pacific S. W. States	.1050–.1125	.135–.1425	.155–.1625

‡ F.o.b. Louviers, Colo., or Butte, Mont.

PILES, TIES—F.O.B.

PILES

Prices per linear foot, fir and pine, bark on, f.o.b. cars, New York. Fir base on Wash. and Ore. points to New York shipping area; pine based on freight fr Norfolk.

Dimensions	Points	Length	By Rail— Pine*	Fir
12-in. at butt	6-in.	30 to 50-ft.	$0.34	....
12 in.— 2 ft. from butt	6-in.	50 to 59-ft.	.35	....
12-in.—2-ft. from butt	6-in.	60 to 69-ft.	.36	....
12-in.—2-ft. from butt	6-in.	90 to 100-ft.	....	.51
13-in.— 3-ft. from butt	5-in.	91 to 100-ft.	....	.58
14-in.— 2-ft. from butt	6-in.	50 to 69-ft.	.41	.61
14-in.— 2-ft. from butt	6-in.	70 to 79-ft.	.43	.89
14-in.— 2-ft. from butt	5-in.	80 to 85-ft.	.53	....
14-in.— 2-ft. from butt	5-in.	85 to 89-ft.	.56	....
14-in.— 2-ft. from butt	5-in.	90 to 100-ft.	....	.61

* Pine piling over 80-ft. available only in limited quantities.

RAILWAY TIES

Prices f.o.b., per tie for carload lots:		6"x8"x8' Untr.	6"x8"x8' Tr.	7"x9"x8'6" Untr.	7"x9"x8'6" Tr.
Boston	Oak	$1.50	....	$2.00	....
	Pine	2.00	$3.00*a*	2.50	$3.00*a*
New York	S. L. Sap Pine	1.43/1.54 *g*	2.59	1.76	2.86
	Mixed Oak	1.71	2.59	2.42	3.58
Birmingham	White Oak	1.00	1.60*a*	....	2.25*a*
Chicago	Red Oak	....	2.00/2.25*a*	....	2.87/3.6
Los Angeles	Douglas Fir	2.00	3.25*a*	2.90	4.70*a*
Philadelphia	Red Oak	....	2.10*ag*	....	3.25*ag*
St. Louis	White Oak	1.48	....	2.04	....
	Red Oak	1.48	2.05*a*	2.04	2.83*a*
	Sap Pine or Cypress	1.55	....	1.91	....
San Francisco	Douglas Fir	1.25*bef*	....	....	3.00*ef*
Montreal	Birch or Maple	.85	.95	....†	....†

Tr.—Treated; Untr.—Untreated. *a* Creosoted. *b* 6"x8"x8'0". *c* Empty cell. *d* Zinc. *e* Green. *f* F.o.b. cars. † Out of market. *g* January 1943 price none later available.

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder, in drums, f.o.b. works, per 100-lb.	$2.50– 3.
Chlorine cylinders, liquid, per lb., delivered	.06
Calcium chloride, 77–80%, flaked, 100-lb. paper bag, del'd, ton.	18.50–35.
Silicate of soda, 52 deg. in drums, f.o.b. works, per 100 lb.	1.
Soda ash, 58%, in paper bags, per 100 lb. dense	1.
Sulphate of aluminum, commercial, in 100-lb. bags, per ton	23.00–25.
Sulphate of copper, in bbl., per 100-lb.	5.

AN UNBEATABLE COMBINATION

This war has proved in a thousand ways the importance of teamwork; teamwork between army, navy and industry, between navy and air force, between artillery and infantry, between a soldier and his gun. Good men with poor equipment haven't been able to stand up to inferior men with better equipment. Good men *and* good equipment are unbeatable . . . on the fighting fronts, on the air bases, in the shipyards, in the quarries, in the metal mines, in the coal mines.

Experience and reputation in designing and building outstanding excavating equipment led to the selection of Bucyrus-Erie to work with the Army on the design and manufacture of the new 240-mm. howitzer, now in action. We're proud of that selection and of the phenomenal accuracy this weapon is demonstrating in battle. The same factors that make this largest U. S. mobile gun a leader, make your Bucyrus-Erie excavators "years ahead." In this war, all over the world, Bucyrus-Erie excavators, in the hands of good men, are shattering old production records. Post-war Bucyrus-Eries in the hands of your men will be an unbeatable combination.

V-91 C

ARMY E NAVY

Bucyrus-Erie

SOUTH MILWAUKEE, WISCONSIN, U. S. A.

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE—PARTITION—SCORED Per M. lots of 2,000 pieces or over, 3x12x12 in.	4x12x12 in.	8x12x12 in.	STRUCTURAL CLAY TILE—LOAD BEARING—SCORED Per M. lots of 2,000 pieces or over, 8x12x12 in.	10x12x12 in.	12x12x12 in.	BRICK Per M. in quantity, Common backing	Straight hard	LIME Per ton, Hydrated finishing	In paper, Common hydrated	Carload lots, Pulverized or lump
Atlanta	$104.00	$114.00	$190.00	$234.00	$244.00	$250.00	$15.00	$18.04	$26.54	$15.04	$15.04
Baltimore	84.00	90.00	170.00	200.00	260.00	300.00	16.00*k*	20.00*k*	18.00	13.00	2.35
Birmingham	80.00	85.00	160.00	191.00	252.00	288.00	14.50	17.00	18.11	13.64	2.25
Boston	103.75*a*	110.65*a*	207.45*a*	248.90	.....	.....	20.00*i*	20.00*i*	21.00†	.....	16.00
Chicago	72.00	77.00	145.00	197.00	243.00	278.00	12.50	13.50	17.00	15.00	12.35
Cincinnati	65.55	69.90	131.20	148.70	210.35	240.45	22.00	22.00	15.50	13.00	.....
Cleveland	62.75	66.95	125.50	150.60	201.90	231.15	17.00	17.00	15.75*j*	13.25*j*	3.20
Dallas	62.50	67.50	135.00	162.00	212.50	263.00	13.50*i*	15.00*i*	19.00	15.00	15.00
Denver	84.80	95.40	153.70	178.20	212.00	227.90	14.50	18.00	25.00*j*	17.00*j*	20.00
Detroit	92.70	96.70	181.20	206.75	267.50	306.00	20.75	20.75	18.00	16.00	16.00
Kansas City	67.00	69.00	89.00*c*	128.00	163.00	189.00	14.50	16.50	19.32	13.00	10.92
Los Angeles	73.50†*r*	89.50†*r*	128.00†*r*	210.00†*r*	368.00†*r*	460.00†*r*	13.50	15.00	16.50	17.50	17.50
Minneapolis	81.00*b*	88.40*b*	159.90*b*	.....	177.00*b*	246.00*b*	13.60	15.60*g*	21.00	16.00	19.00
Montreal	94.55*a*	100.45*a*	199.50*a*	160.45*a*	109.40*at*	137.40*at*	21.08†*u*	28.35†*u*	24.60*u*	18.00*u*	.....
New Orleans	72.00	72.00	135.00	162.00	210.00	260.00	14.00	.....	18.30	12.08	14.10
New York	78.40	83.60	115.00*c*	193.30*h*	238.80*h*	295.60*h*	17.00/18.00	.....	20.00	14.00	17.00
Philadelphia	85.30	91.00	170.50	204.60	252.00	312.00	17.00	20.00	19.00	16.00	15.00
Pittsburgh	62.35	66.55	124.75	140.25	173.25	198.00	17.50	19.50	17.90	15.40	2.55
St. Louis	67.00	95.00	130.00	190.00	244.00	290.00†	18.00	17.00	22.00	18.00	2.80
San Francisco	96.00	108.00	144.00	108.00*t*	.....	.....	19.00	.....	24.00	23.00	2.30
Seattle	115.00	125.00	230.00	.....	.....	.....	20.00*f*	21.00*f*	20.00*s*	20.00*s*	20.00

† F.o.b. *a* Smooth. *b* Carload lots delivered to job. *c* 6x12x12 in. *d* Not load bearing. *e* 48 lb. tile. *f* Less $1.00, ½ cash 15 days, balance 30 days. *g* Selected common. *h* F.o.b. Perth Amboy, N. J. *i* F.o.b. Warehouse only. *j* LCL. *k* $1.00 discount if paid in 10 days. *l* Lump. *m* Per bbl., 180 *o* Per bbl., 200 lb. *p* 280 lb. bag. *r* 5% discount 10 days. *s* 2% discount cash. *t* 5½x8x12. *u* 8% sales tax included. *v* 6x12x12-in. *w* Per 220 lb.

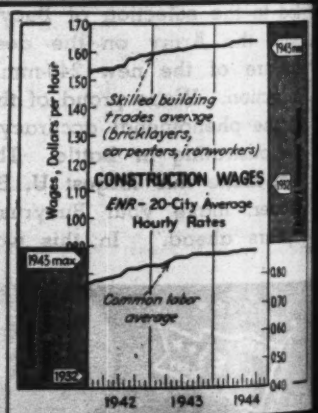
PAINT, ROOFING—F.O.B. CARLOAD LOTS

	RED LEAD Per 100 lb. in 600-lb. (Approx.) bbl. Dry *a*	WHITE LEAD Per 100 lb in oil	READY-MIXED PAINT Per gal., drums Graphite *b*	Aluminum *b*	Ferric Oxide *d*	ROOFING SUPPLIES Carload lots f.o.b. factory Rolls, slate surfaced, 85–90 lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 350 lb. bbl. per ton
Atlanta	$10.25	$14.125	$1.30	$2.25	$1.20	$1.90	$1.61	$1.61	$0.27	$29.00
Baltimore	10.00	13.75	2.00	3.00	2.50	2.30	2.70	2.70	.40	29.00
Birmingham	10.25	14.125	2.35	3.50*r*	1.98*r*	2.04	1.97	1.97	.32	28.35
Boston	10.00	13.75	1.75	2.50	2.31	2.00‡*h*	3.30‡*us*	3.30‡*us*	.25‡	21.00‡
Chicago	10.00	13.75	....	....	....	1.75*h*/*f*	1.74*h*/*f*	1.82*h*/*f*	.33/*f*	23.00/*f*
Cincinnati	10.00	13.75	1.70	2.90	1.60	2.20	2.10*h*	2.10*h*	.33	25.00
Cleveland	10.00	13.75	1.70	2.90	1.60	1.93	1.83*h*	1.83*h*	.25	27.00
Dallas	10.00	14.50	1.88	2.11*n*	.05*l*	1.75*h*	1.66*h*	1.66*h*	.35	39.00
Denver	10.50	14.25	....	....	.27*l*	2.45	2.95	2.95	.35	28.00
Detroit	10.00	13.75	1.75	3.00	1.60	2.25	2.25	2.25	.50	23.00
Kansas City	10.00	13.875	2.30*g*	2.55*gr*	2.16*g*	2.10	2.30	2.30	.28	27.90
Los Angeles	10.25	14.25	1.60	2.25	2.30	2.10	1.50	....	.45	.....
Minneapolis	10.00	13.875	....	....	....	1.8025*i*	1.7098*hi*	1.7098*hi*	.32	23.00
Montreal	9.25	6.25	2.50*p*	4.90*p*	3.15*p*	4.02*t*	2.58*t*	3.01*t*	.89*t*	2.15*t*
New York	10.00	13.75	2.03	....*r*	1.82	1.7098	1.6273*h*	1.6273*n*	.26	25.00
Philadelphia	10.00	13.75	1.60/1.80	2.20*r*	1.55	1.75	1.66	1.66	.32	23.00
Pittsburgh	10.00	13.75	1.05	1.95	.80	1.95	1.94*h*	1.94*h*	.34	26.00
St. Louis	10.00	13.75	2.28*s*	2.89*s*	1.98*s*	1.66	1.66	1.66	.32	24.00
San Francisco	10.25	14.00	1.80	2.75*n*	1.35	1.71	2.40	2.40	.33	20.50
Seattle	10.25	14.25	1.90	3.00	....	2.15	2.16*h*	....	.35	26.50

‡ Delivered. Note: Red lead in oil 50c. higher than white lead in oil. *a* Red lead prices change frequently due to pig lead price changes. *b* U. S. War Dept. Spec. 3-49A. *c* ASTM Spec. D266-31. *d* 80% minimum ferric oxide. *e* Subject to 25% discount. *f* Distributors' price to contractors. *g* 5 gal. can. *h* Per roll, 65 lb. *i* Minneapolis and vicinity. *j* Asphalt pitch. *k* Per 100 *l* Per lb. *m* Per bbl. *n* May, 1941 price, no later quotation available. *p* F 8% sales tax. *r* Not available, except on priority rating; then quoted speci *s* December, 1942 price. *t* Federal tax included. *u* 90-lb. roll. *v* Truck deliv

SKILLED AND COMMON WAGE RATES—PER HOUR

	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasterers	Common Labor Building	Common Labor Heavy Const.
Atlanta	$1.50	$1.25	$1.50	$1.25	$1.50	$0.40	$0.50
Baltimore	1.75	1.4375	1.80	1.625/2.00	1.50	.75	.75
Birmingham	1.75	1.25	1.50	1.25/1.50	1.50	.65	.65
Boston	1.625	1.50	1.65	1.875	1.667	1.00	1.00
Chicago	1.75	1.70	1.76	1.75	1.825	1.10	1.10
Cincinnati	1.875	1.50	1.675	1.45/1.60	1.625	.85	.85
Cleveland	1.875*e*	1.875	1.875	1.875	1.875	1.085	1.15/1.25
Dallas	1.625	1.25	1.50	1.75	1.625	.60	.75/1.25
Denver	1.65*b*	1.50*b*	1.50*b*	1.50/1.625*b*	1.50*b*/*f*	.80*b*	.80*b*
Detroit	1.725	1.50	1.75	1.675/1.75	1.725	.90/100	.90
Kansas City	1.65	1.50	1.625	1.625	1.65	.90	.90
Los Angeles	1.50	1.35	1.625	1.375	1.667	.875	.875
Minneapolis	1.625	1.44	1.625	1.50	1.625*e*	.95	.95
New Orleans	1.50	1.25	1.50	1.50	1.375	.65	.75
New York	2.00*b*	1.85*b*	2.00	2.00*b*	2.00*b*	1.10*f*	.95
Philadelphia	2.00	1.58	2.00	2.00	2.00	.825	.825
Pittsburgh	1.90	1.75	1.75	1.8125	1.875	.90	.80
St. Louis	1.75	1.50	1.75	2.00	1.75	.95	.95
San Francisco	1.875	1.50	1.75	1.50/1.75	1.75	1.00	1.00
Seattle	1.845	1.565	1.745	2.00	1.865	1.145	1.10
Montreal*	1.05	.95	1.00	.90	1.05	.60	.65



b 7 hr. day. *e* Prevailing rate on government work. *s* 35 hr. wk.
* Cost of living bonus now included in basic wage.

ENR Skilled Average: (Bricklayers, Carpenters, Ironworkers) $1.640.
ENR Common Average: $0.883.

NEVER LETS GO

Like pipe repair or hose coupling made with Band-It is THERE TO STAY! ... perfectly tight until the equipment fails or until you take it off!

BAND-ITS ARE BEST *because*

1. Band-It Band is *continuous* 100′ roll of special analysis steel.
2. No waste. You cut every band exactly for the job.
3. No stock of various size, preformed "clamps" needed.
4. Strong. Band has tensile strength over 2300 lbs. in the ¾″ width.

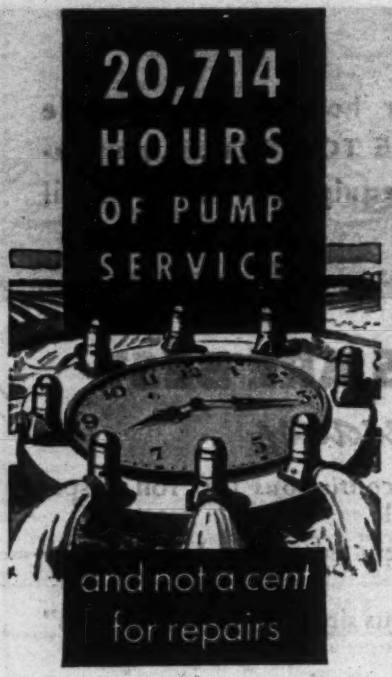
Stop pipe or tank leaks without tearing down or disconnecting the equipment ... in half the time it takes to smoke a cigarette!

The FLAT Band-It bands permit far greater pressures *without cutting the hose.* This means far tighter and more durable hose connections!

Permanently maintained by the manufacturer

Compact, powerful forged steel tool weighs only 4½ lbs.—handles every Band-It job. Use portable or as bench device. *We maintain every Band-It Tool in first-class condition* AT NO COST TO THE USER.

BAND-IT



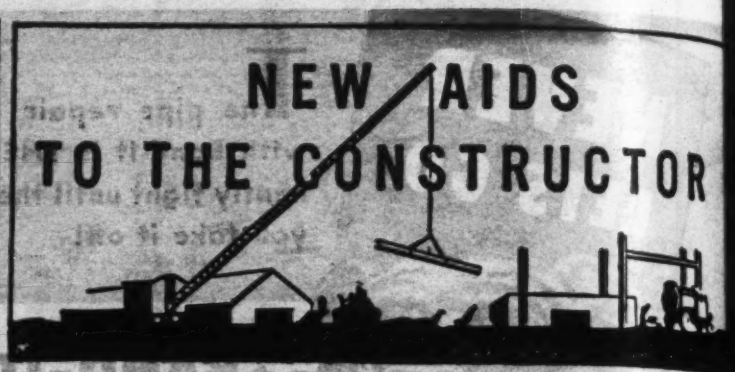
Here is a typical Peerless performance record: A Peerless Deep Well Pump was installed January 29, 1939, in one of the "toughest" pumping locations in America. It was pulled June 2, 1944, to permit installation of another Peerless Pump of greater capacity. For almost 5½ years it was operated at an average of 10 hours daily, with a total of 20,714 hours of meritorious service. Never was a single cent spent on repairs. After pulling the pump, inspection revealed no appreciable wear. It has been installed in a near-by well and is expected to give years of additional service with little or no repair cost. This is the kind of service for which Peerless is noted—low cost of upkeep and unfailing dependability. Make Peerless your choice if economy is your objective.

PEERLESS PUMPS

TURBINE
HI-LIFT
HYDRO-FOIL

PEERLESS PUMP DIVISION
FOOD MACHINERY CORP.
301 W. Ave. 26, Los Angeles 31, Calif.
1250 Camden Ave. S.W., Canton 6, O.
Other Factories:
San Jose 5, Fresno 16, Calif.

NEW AIDS TO THE CONSTRUCTOR



Portable Power Grease Gun

Developed to deliver fast, positive high pressure lubrication, a new Alemite electric portable power grease gun, Model 7190, uses any type of lubricant that seeks its own level. The gun is equipped with large, heavy duty wheels, and has a ball-bearing front caster in the steering mechanism.

Measuring 28½x15x26 in., this gun emit includes a 12-ft. electric cord, 6 ft. ¼ in., 20,000 lb. burst pressure hose and control valve, with hydraulic coupling, combination handle, cord and hose rack. —*Alemite Division, Stewart-Warner Corp., 228 South La Salle St., Chicago 1, Ill.*

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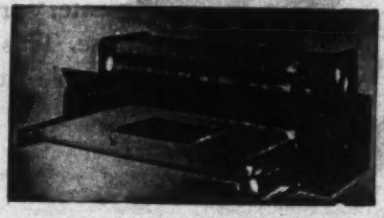
Print Dryer

Speed and economy in overall drying of blue or black and white prints have been achieved, the manufacturer states, through a dryer with variable speed drive motors and controllers in addition



to standard heat regulation. This dryer, in two sizes to handle 25 in. and 44 in. widths, uses little current.

The pressed steel framework cannot warp from the effect of heat, it is claimed; the revolving drum is heavy seamless copper.—*Peck and Harvey, 4327 Addison St., Chicago 41, Ill.*

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Free Flowing Solder

Sheet aluminum can now be lock-seamed or lapped and spot-welded or riveted, and the joint sealed with a new free flowing solder, EutecRod 199, according to the manufacturer's announcement. In long laps, the solder will make joints of moderate strength, but should generally be used as a seal. As may be applied at 400 deg. F., it lesse danger of distortion.

This solder is available in ⅛-in. ro in standard packages of 25 to 200 lb. *Eutectic Welding Alloys Co., 40 Wa St., New York 13, N. Y.*

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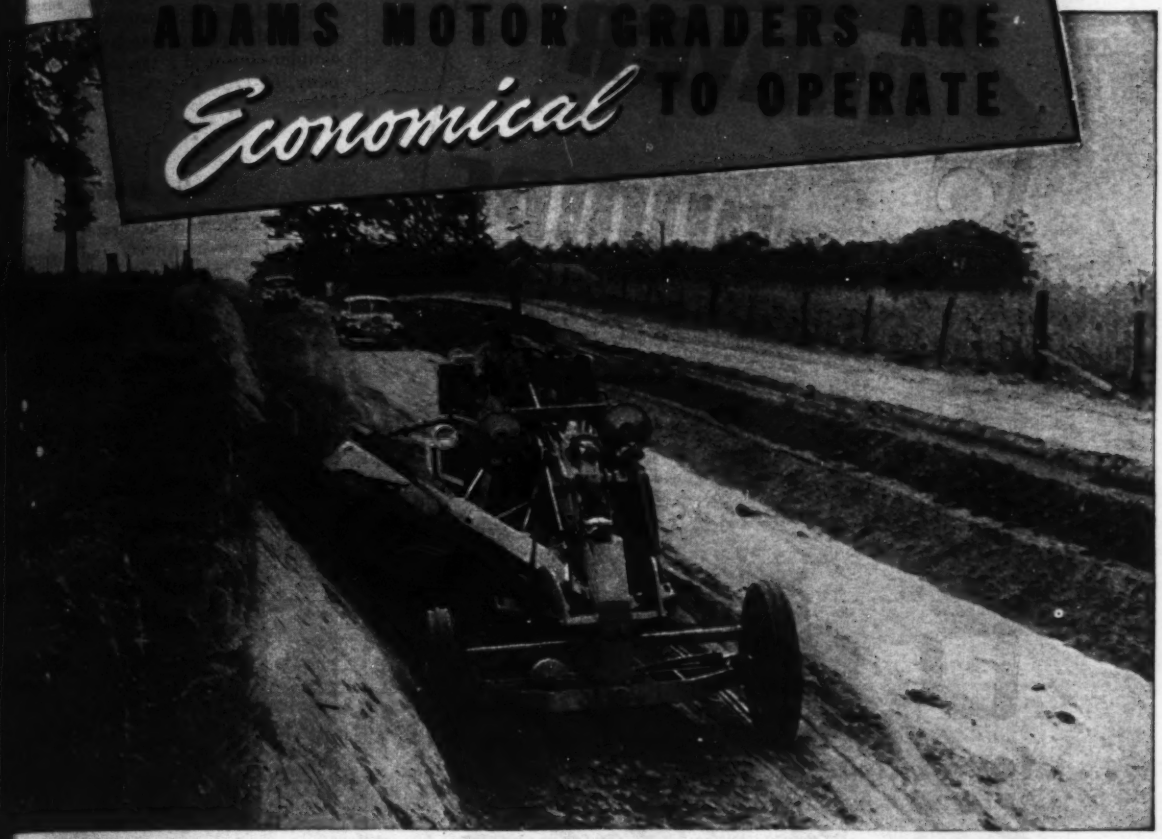
Bucket Pump Lubricator

To help in the conservation of impo tant machinery, a new bucket pu called the "Block Buster" has been d veloped for lubricating trucks, and co struction, industrial and farm machi ery. Designed to handle heavy duty lu ricating jobs easily and quickly, it co tains such important features as: a easily operated, double-acting pum developing 4,000-lb. pressure; a har ened steel, precision-ground piston; simple, positive foot valve; an 18-ga seam-welded container with pump su port bracket which keeps the pump fre

being completely removed when filling and a strong carrying handle whi bears on a large stud bolt to hold th cover and pump in position on the co tainer.

The conical shaped hopper bott automatically feeds all the lubricant i the container to the foot valve and pr vents channeling and loss of prime. Th Graco Block Buster can be obtain

ADAMS MOTOR GRADERS ARE *Economical* TO OPERATE



One of a series of ads on Adams motor grader features

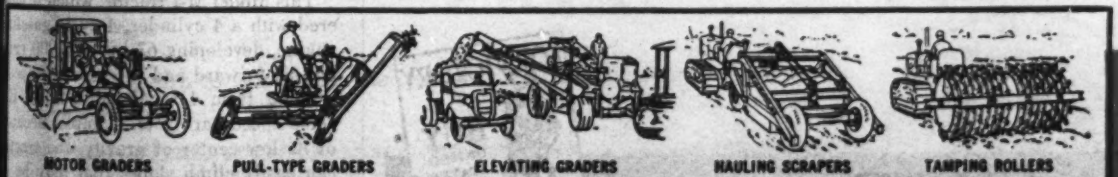
ECONOMICAL motor grader operation involves two considerations—(1) daily operating cost and (2) the machine's ability to stand up under hard usage without excessive repairs. On both considerations Adams are tops.

As to fuel consumption, there are plenty of Adams heavy-duty motor graders doing hard work today on two gallons or less of low-priced Diesel fuel per hour... As to maintenance, Adams machines, with their strong, all-welded and machine-finished construction, seldom need repairs; use the adjustments for wear and they will run for many months without repair parts. The International Diesel engines used have enviable records for economy and when repairs are needed, parts and service are readily obtainable anywhere at fair prices.

Add to this economy of operation their ability to adapt themselves to a wide variety of work, their abundance of power and their ease of operation and you have in Adams motor graders all of the qualities you are looking for. Plan now to standardize on Adams and ask your local Adams distributor for further details.

J. D. ADAMS COMPANY • INDIANAPOLIS, IND.

At war's end we'll need many new roads and many jobs for returning service men. Plan post war projects now and meet both needs.



ADAMS ☆ ROAD-BUILDING AND ☆ EARTH-MOVING EQUIPMENT

. . . for

Low Cost Water

• The "Certified" tag on every Carver Pump is your assurance of top performance on the job. It's the kind of performance that means more water at less cost. Each pump is thoroughly tested so that you will get full capacity right from the start and keep on getting it, on tough jobs or easy ones, with less time out for maintenance and repairs.

Available from 1½" to 8", 5,000 to 120,000 gallons per hour. For details, see your nearby Carver distributor or write direct.

THE CARVER PUMP CO. Muscatine, Iowa

with 5½ ft. or 10½ ft. hose assemblies of either the hydraulic adapter-equipped, giant buttonhead coupler-equipped type, or standard buttonhead coupler-equipped type.—*Gray Company, 60-11th Ave. N. E., Minneapolis, Minn.*

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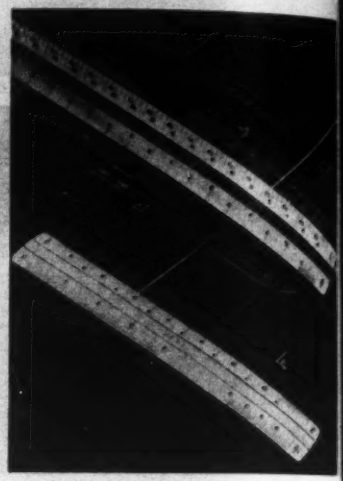
Plastic Scales

Said to be very accurate and warp-resistant, new architects' and engineers' scales are injection-molded of Tenite plastic.

These scales are white, with easily legible black lines and figures. The triangular model has stripes in different colors on each side to facilitate finding the desired scale.—Molded by *American Molding Co., San Francisco,* for *A. Lietz Co., San Francisco.* Tenite is product of *Tennessee Eastman Corp., Kingsport, Tenn.*



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Snow Tractor and Trailer

A front axle equipped with wheels or skids makes a new two-man snow tractor practical for either snow travel or highways. Long, wide tracks with rubber-faced shoes spread the tractor's weight, preventing its sinking into snow and assuring maximum traction.

This Model M-7 tractor, which is powered with a 4 cylinder, 4 cycle gasoline engine, developing 63 hp. at 3,900 rpm. has six forward and two reverse speeds, ranging from 4 to 41 mi. per hr. Reverse speeds are 3 to 11 mph. Because of its low center of gravity, the tractor can easily climb slopes that may be as steep as 45 deg. The trailer has a load capacity of one ton, while the unit itself weighs 640 lb. including the insulated canopy top. The power for the lights and body heater is supplied by the tractor. The tractor seats two men and is provided with a curtain enclosure and

This Might Happen to You

SNAP!!—a vital part just gave way on this important job. It looked like a 10 day delay if the part had to come all the way from the factory. The contractor faced a $600 rental loss and besides, the job would be behind schedule by some 3840 yards of concrete.

But thanks to a nearby A. E. D. member the part was replaced within 8 hours. The contractor lost only $60 rental cost and the job was set back only 384 yards.

Unexpected things like this happen to the best of machinery, but when they do, remember, the manufacturers have wisely made sure their machinery is distributed and serviced by reliable Associated Equipment Distributors. More than 500 A. E. D. members are ready to give you "Neighborhood Service" and have the proper facilities to repair or rebuild quickly and locally any piece of their equipment that gives way under extra wartime abuse.

Learn to know your nearest A. E. D. Members and use their services.

Look for the A. E. D. Emblem of Good Service.

ASSOCIATED EQUIPMENT DISTRIBUTORS – AED MEMBER

ASSOCIATED EQUIPMENT DISTRIBUTORS

NATIONAL PRESS BUILDING • WASHINGTON, D. C.

LOOK FOR THE A. E. D. INSIGNIA – THE SYMBOL OF GOOD SERVICE

HEIL

Hydraulic Bulldozers and Trailbuilders

(designed to work with Cletrac Tractors)

give you more speed, greater flexibility — and handle the tough jobs easily

You get more speed because the unit is lighter and stronger due to the replacement of heavy members with welded box sections. These units give you greater flexibility and maneuverability for two reasons. (1) You get full visibility for safe, efficient handling. (2) You get instant response to a touch on the quick-acting controls.

Heil Bulldozers and Trailbuilders have the power, rugged strength, and sound engineering design that enable you to move through the tough spots with ease. Most owners agree, "For full loads and more yardage at lower cost, use Heil quality Earth-moving equipment."

Write for bulletins. R-36

SEE YOUR CLETRAC TRACTOR DISTRIBUTOR

ARMY E NAVY

THE HEIL CO.

GENERAL OFFICES • MILWAUKEE 1, WISCONSIN

heater for low temperature operation. The engine has a heavily insulated hood cover, and special engine preheater to assist starting.—*Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.*

• • •

Welding Goggle

Newly designed eyecups, anatomically molded for the right and left eye, are featured in the recent AO Duraweld welding goggle. The cups have larger edges, rounded to fit the contour of the face; they are shallow, but with deep sides. Improved nasal fitting also adds comfort and safety. Side shields are designed for increased ventilation and prevention of lens fogging, with new

style louvers that make it impossible for stray light rays or sparks to enter the eyes.

The goggle has a non-slip, one-piece, moisture-resistant headband, and is equipped with Noviweld lenses in 3, 4, 5, 6 or 8 shades. Optional lenses for absorbing yellow sodium flare or of dark shades for workers near welding operations are also available.—*American Optical Co., Southbridge, Mass.*

• • •

Synthetic Resin Glue

Setting at 70 deg. F. in 8 to 10 hours, Cascophen RS-216 liquid resin glue, used with a separate dry-powder catalyst, is said to be exceptionally durable. This product, which can be stored indefinitely at room temperature, bonds at low pressures and on uneven surfaces, and the bond meets any joint test required by U. S. government specifications.

This glue also withstands heat and moisture well. If applied in temperatures warmer than 70 deg. F., shorter time is necessary for setting.—*Casein Co. of America, 350 Madison Ave., New York 17, N. Y.*

QUICK QUIZ FOR CONSTRUCTION MEN

One of These Three May Be Your Answer to Lower Maintenance Costs

Q Does "on-the-job" power lubrication add "M.P.T."* to machines?

A You bet it does! It can cut lubrication time up to 75% over hand gun lubrication, leaving more time for work. In one typical case, Alemite Portable Service Stations cut "cat" track roller wear by one-third — keeping machines on the job longer between overhauls. And that, friend, is adding "M.P.T."* to machines.

*More Productive Time

Alemite Portable Service Stations Put Power Lubrication "On-the-Job"

This development by Alemite is a complete power lubrication department on wheels that carries lubricants to machines on the job. The unit includes high- and low-pressure Alemite Barrel Pumps, Alemite Motor Oil Dispenser, hose reels and gas engine air compressor.

This type of "on-the-job" lubrication has proved its efficiency on construction projects everywhere. Its increasing use shows that it is destined to play an important role in peacetime competition. Write for catalog. Alemite, 1823 Diversey Parkway, Chicago 14, Illinois, or Belleville, Ontario.

Q Are portable service stations just for lubrication?

A No. They have many uses. For high pressure power lubrication of all bearings equipped with pressure gun fittings. This covers practically every type of machine. For rapid filling of gear housings, final drives, rear axles, transmissions and crank cases. For tire inflation, engine cleaning, paint spraying, etc. Versatile outfit, isn't it?

Q Does "on-the-job" lubrication save on lubricants?

A Definitely. Here's the experience of one organization: using the "barrel to bearing" application of lubricants from an Alemite Portable Service Station, a saving of 19% was made in the consumption of grease and oil. And every bearing and gear got clean, uncontaminated lubricants. Interested in a saving in lubricants?

WANTED
Tough Job by Man with "MML" Degree!

This man, an Alemite Lubrication Specialist, is a "Master of Modern Lubrication." His technical training, skill and experience equip him to come on your job and consult with you about applying the most modern lubricating methods. He has added more productive time to machines, saved lubricants and man power. He has installed safer, surer, more accurate lubricating methods.

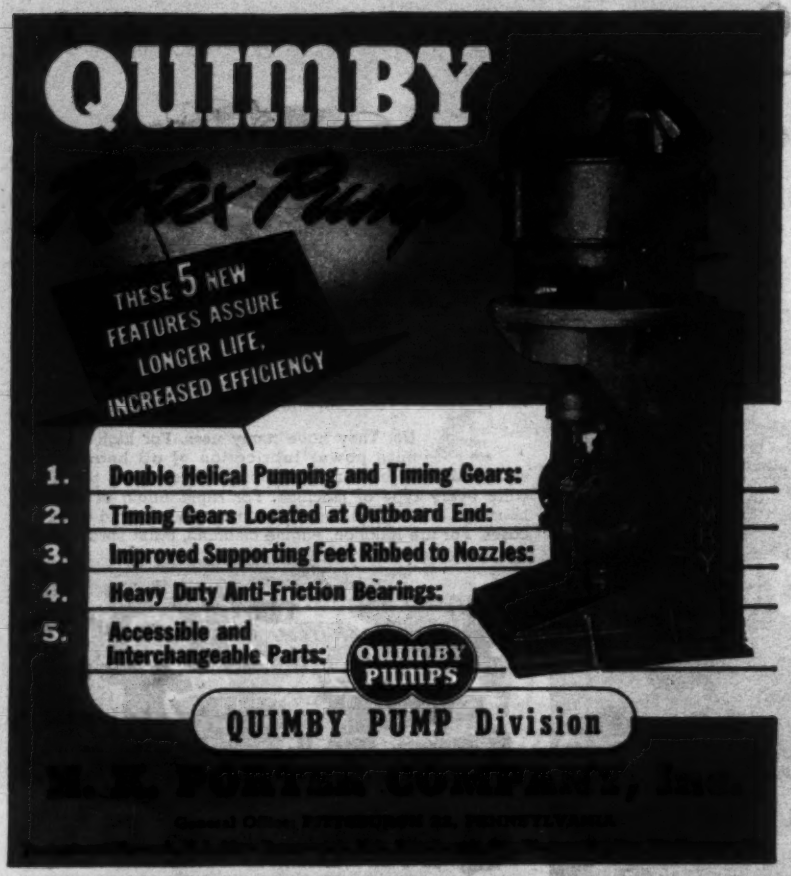
He's ready to go to work for you now, backed by the world's most experienced organization in the handling and application of lubricants. Call him. Or, if you prefer, write, wire or phone Alemite for his address.

Subsidiary of STEWART WARNER

ALEMITE

First in Modern Lubrication

CONSULTATION • ENGINEERING • EQUIPMENT • LUBRICANTS • MAINTENANCE


QUIMBY
THESE 5 NEW FEATURES ASSURE LONGER LIFE, INCREASED EFFICIENCY
1. Double Helical Pumping and Timing Gears:
2. Timing Gears Located at Outboard End:
3. Improved Supporting Feet Ribbed to Nozzles:
4. Heavy Duty Anti-Friction Bearings:
5. Accessible and Interchangeable Parts:
QUIMBY PUMPS
QUIMBY PUMP Division

EXCEPTIONAL OPPORTUNITY
WANTED ENGINEERS EXPERIENCED IN SALES...
... with knowledge of molded plastic plywood field
A large and old established manufacturer specializing in molded plastic plywood and other laminae is seeking several experienced sales engineers.
Applicants should have an engineering background and broad sales experience. Contacts with prospects in the consumer goods field and with aircraft manufacturers helpful. Willingness to travel essential. Headquarters located in New York City.
Successful applicants will be the nucleus of a sales force in a company with unlimited peace time possibilities. Salary in line with the high qualifications required.
In replying please give details of experience, education, age and general background. Replies will be treated confidentially. Those now employed at their highest skills in war work can not be considered.
Address Dept. P-612
Engineering News-Record
330 West 42nd St., N. Y. C.

MANUFACTURERS' ACTIVITIES

C. Fred Sauereisen, owner of the Sauereisen Cements Co., manufacturers of sulphur base melting type pipe joint compound and acid-proof cement, has announced that his firm is now occupying an enlarged plant at 1045 North Canal Street, Pittsburgh, 15, Pa.

The owner says that this is the fourth expansion move made by his firm since 1899. In addition to joint compounds over 30 different technical cements and compounds are manufactured including liquid porcelain.

John F. Van Way has resigned as western advertising manager of "Pit and Quarry" to become sales respresentative of the Clearview Equipment & Mfg. Co., St. Louis, Mo. He was formerly associated with the Geo. A. Fuller Co., during construction of the Dodge-Chicago plant of the Chrysler Corp., as concrete plant superintendent, supervising the erection of several plants and later operation of them. A graduate of the University of Illinois, he was advertising and sales promotion manager of the C. S. Johnson Co., Champaign, Ill. for several years.

Homer S. Yetman, since 1938 western representative of the metallic lead products division of the Lead Industries Association, has been placed in charge of that division's activities in the construction field for the entire country with headquarters at the association's New York office.

Mr. Yetman has long been an active member of the American Society of Sanitary Engineering, serving on many of its committees. He is a member of other technical organizations in the field of sanitation. He also has represented the lead industries in activities of the American Water Works Association.

The Appointment of Cecil H. Bathurst as sales manager and Weldon O. Yocum as advertising manager of the Sewall Paint & Varnish Co. has been

Teamwork—the American Way!

✓ THE JOB—Airstrip on Kwajalein

✓ THE POWER—International Diesel

✓ THE BUILDERS—Uncle Sam's Own Seabees

—Official U. S. Navy Photo

HERE'S A TEAM to be proud of . . . International Diesel TracTracTors and the Navy's Seabees. This team is making construction history in the Pacific.

There's no job too tough for these fighter-builders. Construction of roads, docks, bridges, airstrips and camp sites is their daily fare. So is the constant, vigilant maintenance of these naval installations. Add to this a variety of other dirt-moving jobs that pave the way for airpower, footpower and firepower. No wonder one of the Seabees' mottos is: "We *defend* what we build."

• • •

The TracTracTors you're doing without this year are serving on Kwajalein, Saipan, Funafuti, the Solomons, Bougainville, Guadalcanal. That's why it's up to all tractor operators on the home front to conserve equipment and make it last.

Harvester and the International Industrial Power distributors stand ready to see you through.

INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue Chicago 1, Illinois

INTERNATIONAL HARVESTER

Power for Victory . . . Power for Peace

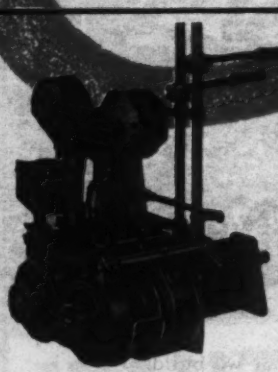
HEIL Cable Scrapers are fast-loading

and unload cleaner with less cable pull

You can pick up heaping bonus loads easier and faster with this efficient Heil Cable Scraper — because it "bites deep" in hard-packed soil just as easily as it loads loose soils like sand.

For improved scraper performance, experienced Heil engineers have developed a scientifically located draft pivot-point, tilting-floor push-out, contoured bowl design, all-welded sections, and many other features that add up to bigger yardage at lower costs. Investigate now and be prepared for post-war equipment purchases.

Write for bulletins.



Dependable Power Control Units for all makes of tractors

Smooth-operating brake and clutch assemblies eliminate shocks and jerks; the large drums run cool; the sheaves are designed to reduce wear on cables. Fingertip control gives lightning-fast response for bigger yardage. Designed for all types of cable-operated equipment on all makes of tractors.

Write for bulletins.

SEE YOUR INTERNATIONAL TRACTRACTOR DEALER

B-35

ARMY E NAVY

THE HEIL CO.

GENERAL OFFICES • MILWAUKEE 1, WISCONSIN

announced by Grover M. Hermann, pr ident of the American-Marietta C which recently acquired the Kansas C concern. Bathurst, has been with t Sherwin-Williams organization for fo teen years, and has an outstanding re ord in paint merchandising.

Yocum, formerly advertising manag of Oscar Mayer & Co., Chicago, w work with Bathurst in the preparati of a new merchandising and dealer a vertising program.

J. E. SWANSON has been elected vice president of the Graver Tank & Mfg. Co., East Chicago, Ind., according to a recent announcement by E. N. Gosselin, president.

Mr. Swanson, who has been with the company for more than 25 years, has served in various executiv capacities, having most recently he the position of general manager of sale

HENRY H. RITCHETTE has been a pointed manager of the contractor's too division of the Independent Pneumati Tool Co. with headquarters in Chicag the company's home office. He will b in charge of distributor policies and a pointments through district manager assisting distributors in the sale an service of rock drills, paving breaker clay diggers, and related contractor's ai tools.

Prior to joining the Independe Pneumatic Tool Co., Mr. Ritchette wa a district manager for Johns-Manvill Sales Corp. and has previously had ex perience as a design engineer on munic ipal projects and as a sales manager fo H. O. Penn Co., construction equipmen distributors of New York.

E. E. LEVAN has been elected Presi dent of Haynes Stellite Co., a unit o Union Carbide and Carbon Corp., succeeding the late Francis P. Gormely. Mr. LeVan was graduated from Pennsylvania State College in 1917, with a degree in mechanical engineering. After spending five years as a mechanical engineer with Bethlehem Steel Co., he entered the employ o Haynes Stellite Co. as a sales engineer in 1922, becoming chief engineer three years later. In 1927 Mr. LeVan entered the sales department, and in 1929 be came general sales manager. He was elected vice-president in 1939, and on

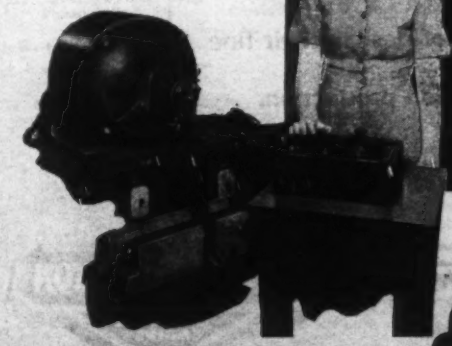
BEARINGS BEAR UP

Powered by Tri-Clad sleeve-bearing motors, this battery of milling machines has been in round-the-clock operation on war work since before Pearl Harbor. The short-center, hinge-base drives put a hard, steady pull on the motor bearings. In addition, the machines are in the hands of several different operators each day, many newly trained. Despite the severe service, motor-bearing performance has been above prewar levels. Maintenance manpower has been conserved, and production held on schedule.

Tri-Clad motors driving milling machines in the River Plant Division of the Savage Arms Corp., Chicopee Falls, Massachusetts.

How torture tests on TRI CLAD bearings have helped us lengthen motor life

Before the Tri-Clad motor-bearing designs were adopted, many models of this new motor were tested to destruction under heavy shaft loadings applied from all directions, with various kinds of lubricants, and under many different speed and temperature conditions. As new Tri-Clad types are introduced, these tests continue—some for years—in "torture" areas such as shown at right. Each test broadens our knowledge, offers new clues to longer motor life. Throughout industry, results have substantiated the improved bearing performance forecast by these tests. *General Electric Company, Schenectady 5, New York.*



GENERAL ELECTRIC

TRI CLAD MOTORS

Buy all the BONDS you can — AND KEEP ALL YOU BUY

The performance records made by over 2,000,000 BRIGGS & STRATTON Engines testify to their perfection of design, their fine engineering, and to precision production.

Air-Cooled Power

4 CYCLE BRIGGS & STRATTON GASOLINE ENGINES

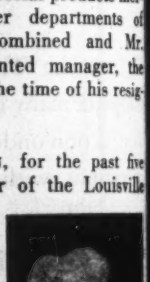
Manufacturers of all types of appliances, tools and equipment requiring dependable, compact power units are invited to investigate the performance record of Briggs & Stratton engines. The latest models are backed by the experience gained in twenty-five years of *continuous* production of AIR-COOLED Gasoline Engines. BRIGGS & STRATTON CORPORATION, Milwaukee 1, Wisconsin, U. S. A.

May 22, 1944, was made vice-presid and general manager, and a director Haynes Stellite Co. Mr. LeVan will co tinue to make his headquarters at K komo, Ind., where the general offices a plant are located.

HOWARD R. MURPHY, manager of th merchandise department, Caterpill Tractor Co., Peoria, Ill., resigned July 31 to become associated as a principal with W. K. Holt in the Caterpillar distributorship in San Antonio and Corpus Christi, Tex.

A graduate of the University of California in 1925, having majored i civil and agricultural engineering, Mr Murphy joined the Caterpillar organi zation in 1927 as supervisor of agricul tural sales in the midwest. In 1930 he took over the managership of the Lam pert Implement Co. Later he returned to the Caterpillar Co. When war brought the need for a department to handle the manufacture of special products in 1942 Mr. Murphy was placed in charge. Dur ing 1942-1943 he also served the War Department as chairman of the Ord nance Department Industry Integration Committee on heavy mobile artillery car riages. In 1943 the special products mer chandise, and order departments of Caterpillar were combined and Mr. Murphy was appointed manager, the position he held at the time of his resig nation.

JOHN H. MALLON, for the past five years sales manager of the Louisville Cement Co., has been elected vice president. Starting with the company in 1920, Mr. Mallon has become known as one of the leading figures in the development and growth of the masonry cement industry, and as a recognized authority on mortar, brick work, and natural cement. His investi gations and research on water-tight ma sonry have become a part of the building industry's accepted data on that subject.



As Vice President, Mr. Mallon will continue to direct the sales, advertising and promotion departments.

JAMES M. STRAUB has been elected president of the Fort Pitt Bridge Works, Pittsburgh, Pa., succeeding George D. Wick, who continues as director. Other officers elected were H. R. Blickle, vice president and consulting engineer, C. O.

TELSMITH

CRUSHING AND SCREENING PLANT

. S. Army Engineers are building a huge dam in Tenssee. It will require 1,500,000 tons of aggregate—4 sizes crushed rock: 3"- 6", 1½"- 3", 3/16"- ¾", minus 3/16"; d one size of sand.

To produce this material, Ralph E. Mills Co., of anoke, Va., opened a quarry at the dam site. The ck is a high calcium limestone. Telsmith designed the mplete crushing and screening plant, and furnished st of the equipment. Capacity is in excess of 200 tons r hour.

On war jobs, equipment as well as men must produce re *and faster* without "cracking" under the strain. r years Telsmith has been building equipment that can turn it out, without taking time out. Telsmith complete sand and gravel and rock crushing plants are a *known quantity* to miners, contractors and aggregate producers.

That's why Telsmith gets the call on so many war jobs—to build army and navy air bases, dry docks, roads, dams, and other big construction projects.

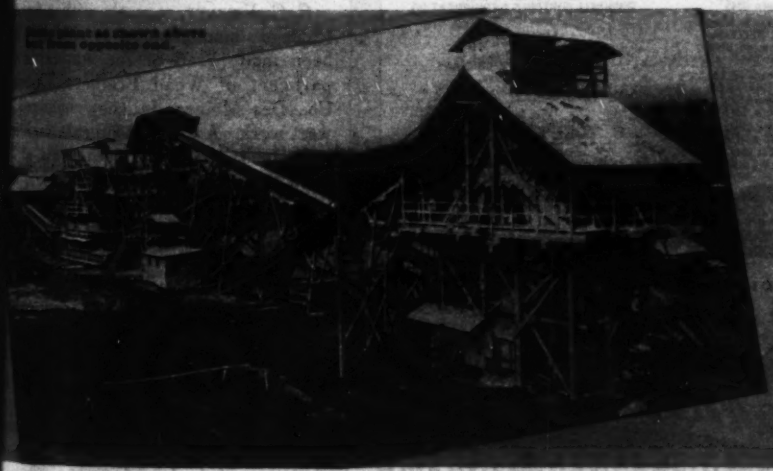
That's why your Uncle Sam is now taking most of the Telsmith equipment being built. It's going overseas, to build for the armed forces' needs.

You can get Telsmith equipment—for war work now—and after the war for all your needs. Get Bulletin Q-2 today.

SMITH ENGINEERING WORKS, 500 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

Cable Addresses: Sengworks, Milwaukee—Concrete, London

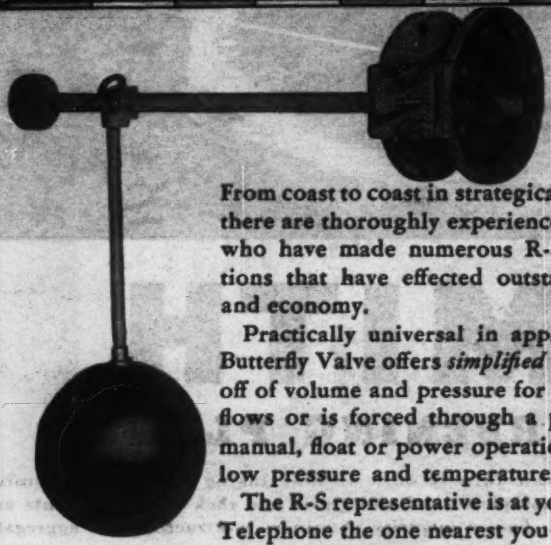
11 East 42nd St. New York 17, N. Y.	211 W. Wacker Drive Chicago 6, Ill.	713 Commercial Trust Bldg. Philadelphia 2, Pa.	247 Third St. Cambridge 42, Mass.	G. F. Seeley & Co. Toronto, Ont.	Mines Eng. & Equip. Co. San Francisco 4—Los Angeles 14
Louisville M. & S. Co. Louisville 8, Ky.	Rish Equipment Co. Charleston 22 & Clarksburg, W. Va.	Rish Equipment Co. Roanoke 7 & Richmond, Va.	North Carolina Eqpt. Co. Raleigh & Charlotte, N.C.		Wilson-Weesner-Wilkinson Co. Knoxville 8 & Nashville 6, Tenn.



TELSMITH
Quarry Plant Equipment

One	48" x 12' Telsmith Heavy-Duty Apron Feeder
One	30" x 180' Telsmith Belt Conveyor
One	48" x 7' Telsmith Plate Feeder
One	30" x 182' Telsmith Belt Conveyor
One	16-B Telsmith Primary Breaker
One	24" x 78' Telsmith Belt Conveyor
One	24" x 75' Telsmith Belt Conveyor
One	No. 48 Telsmith Gyrasphere Secondary Crusher
One	30" x 131' Telsmith Belt Conveyor
Two	4' x 12' Telsmith Double Deck Pulsator Screens
Two	18" x 21' Telsmith Belt Conveyors
Two	4' x 16' Telsmith Single Deck Pulsator Screens
Twelve	Telsmith Bin Gates
Three	18" Telsmith Belt Conveyors
One	18" x 102' Telsmith Belt Conveyor

National R-S Valve Engineering Service



No. 579

No. 579. Direct action float valve with counterweight assembly.

From coast to coast in strategically located cities, there are thoroughly experienced R-S Engineers who have made numerous R-S Valve installations that have effected outstanding efficiency and economy.

Practically universal in application, the R-S Butterfly Valve offers *simplified* control and shut-off of volume and pressure for any material that flows or is forced through a pipe—adapted to manual, float or power operation under high or low pressure and temperature. 15 to 900 psi.

The R-S representative is at your beck and call. Telephone the one nearest you for prompt service or write for catalog.

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POST POWER SUPPLY CO.
P. O. Box 544

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Boston 10, Mass.
W. B. PARSONS CO.
10 High St.
HUBbd 4119

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R. W. CRANE
37 Parkwood, Kenmore, N. Y.
DWLawr 8141

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304 Builders Bldg.
Phone 3-4481

Chattanooga 2, Tenn.
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Chattanooga Bank Bldg.
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Harrison 1473

Cincinnati 2, Ohio
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2413 Union Central Bldg.
Main 2290

Cleveland 13, Ohio
ASHMEAD-DARKS CO.
Rockefeller Bldg.
Main 6192

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PRODUCTS, INC.
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3-5156

Detroit 4, Mich.
SPURGEON COMPANY
5250 Joy Road
Tyler 7-2750

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POWER SPECIALTY CO.
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VALVE DIVISION
R-S PRODUCTS CORPORATION
116 Berkley Street • Philadelphia 44, Pa.

R-S Streamlined BUTTERFLY VALVES

Miller, treasurer, and P. B. Str... secretary.

THE T. L. SMITH CO., Milwau... Wis., has promoted H. C. Peters to ... sistant to the president and vice-pr... dent in charge of engineering rese... and development.

STEWART B. IGLEHART, chairman ... the board of Iglehart, Caldwell & S... Inc., building construction contra... of New York, is on an eight-months b... ness trip to Peru, Chile, and Ecuado...

THE NATIONAL POWDER CO. of Eld... Pa., has opened a branch office in ... First National Bank building, Latro... Pa., with P. T. Rogers as manager. G... H. Edwards, of Latrobe has joined ... company as a special representative ... the sales department.

H. H. FULLER has been elected v... president in charge of West Coast st... activities of Bethlehem Steel Co. ... succeeds W. H. Stewart who has held t... office for the past twelve years. Mr. Ste... art, though retiring from active du... will continue in an advisory capaci... Mr. Fuller entered the employ of Be... lehem at the close of the first world w... In 1936 he became assistant manager ... sales for the New York district and t... years later was appointed district sa... manager.

JOHN H. ROWE, who for the past se... eral years has been Chicago manag... for the Boston Woven Hose & Rubb... Co., has been made vice-president ... charge of western sales, covering the te... ritory from Chicago to the Pacific Coa...

Stuart A. Guild becomes manager ... the Chicago office. He has been in char... of the Connecticut, Rhode Island a... western Massachusetts territory f... some time past.

C. G. EWERTZ, recently with a firm ... Chicago management engineers, h... been made head of the standards d... partment of Wood Brothers Thresh... Co., Des Moines, Ia., now engaged ... war work. An architectural engine... he helped design the cathedrals of S... John the Divine and St. Patrick's, a... the Riverside Church, in New Yo... City.

HARRY A. FENNERTY has been elect... president of the Alliance Machine C... Alliance, Ohio. He succeeds his fath... in-law, W. H. Purcell, founder of t... company 43 years ago, who died r... cently.

G. W. Shem, a director and also pre... dent of the Alliance Structural Co. ... chairman of the board.

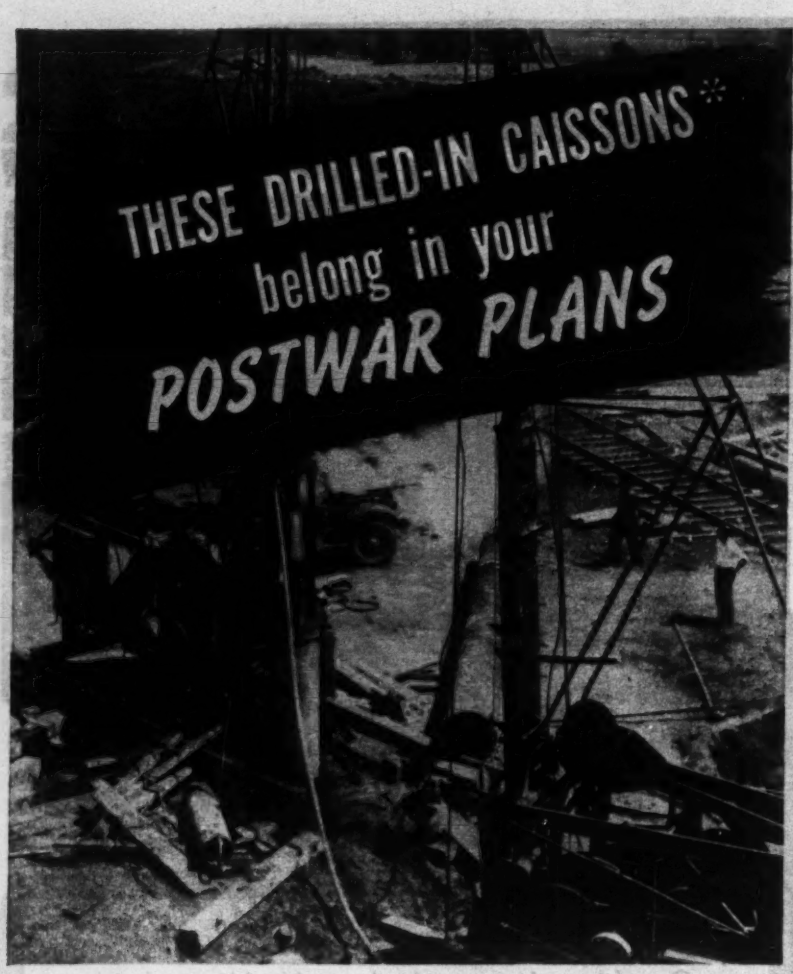
More work... lower cost

THANKS TO LA PLANT-CHOATE "KNOW HOW"

Above: This crude, hand-operated LaPlant-Choate dozer was developed in 1923 for use on the famous Dixie Highway in Kentucky. Modern hydraulic and cable operated models offer numerous improvements in blade design, operating features and all around dependability.

DID YOU KNOW that the first LaPlant-Choate bulldozers were built for Best and Holt tractors long before the days of "Caterpillar" . . . that LaPlant-Choate pioneered the first production dozer with hydraulic control (1925)... a dozer with an angling blade (1927)... a tilting blade (1929)? Did you know that LaPlant-Choate engineers developed the first lightweight dozers and scrapers to be flown in transport planes (1942)... and the first dozers to be used successfully with Army tanks (1943)? Did you know that last year, according to official WPB figures, LaPlant-Choate built over 33% of all the dozers produced in the United States by 18 different companies . . . and that LaPlant-Choate now controls over 15 patents covering basic improvements in dozer design?

One of the main reasons for the world-wide popularity of LaPlant-Choate dozers is their proved ability to do *a better job at lower net cost.* In other words, when you buy a LaPlant-Choate dozer, you get more than just a blade in front of a tractor. You get an "engineered unit" developed and improved through *21 years of field experience* with thousands of LaPlant-Choate dozers in all parts of the world. Moreover, as one of America's largest suppliers of dozers to the armed forces, LaPlant-Choate is gaining additional experience that assures you of *even better performance* from LaPlant-Choate dozers in the future. So before you buy any new dozer equipment, be sure to get complete facts on LaPlant-Choate's new, improved line—with *either cable or hydraulic control.* LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa.



Individual Drilled-In Caissons on this construction job supported loads up to 1356 tons. They were of ½-inch wall thickness in three lengths—a 70-foot bottom section and two top sections of 35 and 50 feet to accommodate various depths.

When your designs for heavy peacetime construction work go on the drawing board, consider the many practical time-and-money saving features of Drilled-In Caissons.*

They are "right at home" under the heaviest bridges, buildings and viaducts—through all kinds of soil and to any depth. Loads may be compressive, tensile, or torque.

Drilled-In Caissons of ARMCO Spiral Welded Foundation Pipe make for straight driving with least time and effort. They are known for their strength and water-tightness all the way down to bedrock. The spiral weld construction imparts stiffness and resistance to collapse; it helps assure straightness when the caisson is set.

You'll find it well worth your time to look into the many features of these caissons. Diameters range from 6 to 36 inches; wall thicknesses from 3/16 to 1/2-inch. You can specify any length (not random) that can be handled and shipped. For complete information as well as quotations and shipping promises, write The American Rolling Mill Co., Pipe Sales Division, 2991 Curtis St., Middletown, O.

**Patented by the Drilled-In Caisson Corp., of New York and Chicago.*

ARMCO

ARMCO FOUNDATION PIPE

For Postwar Construction—"P war construction plans for relocat and widening highways, lengthen airports and building dams definit show the earthmoving trend is longer hauls," this booklet says. I an 8-page pamphlet that claims m power and less weight increases t manufacturer's production. It discus the value of rubber-tired earthmov equipment and contains many contr tor-named job illustrations.—*R. G. Tourneau, Inc., Peoria, Ill.*

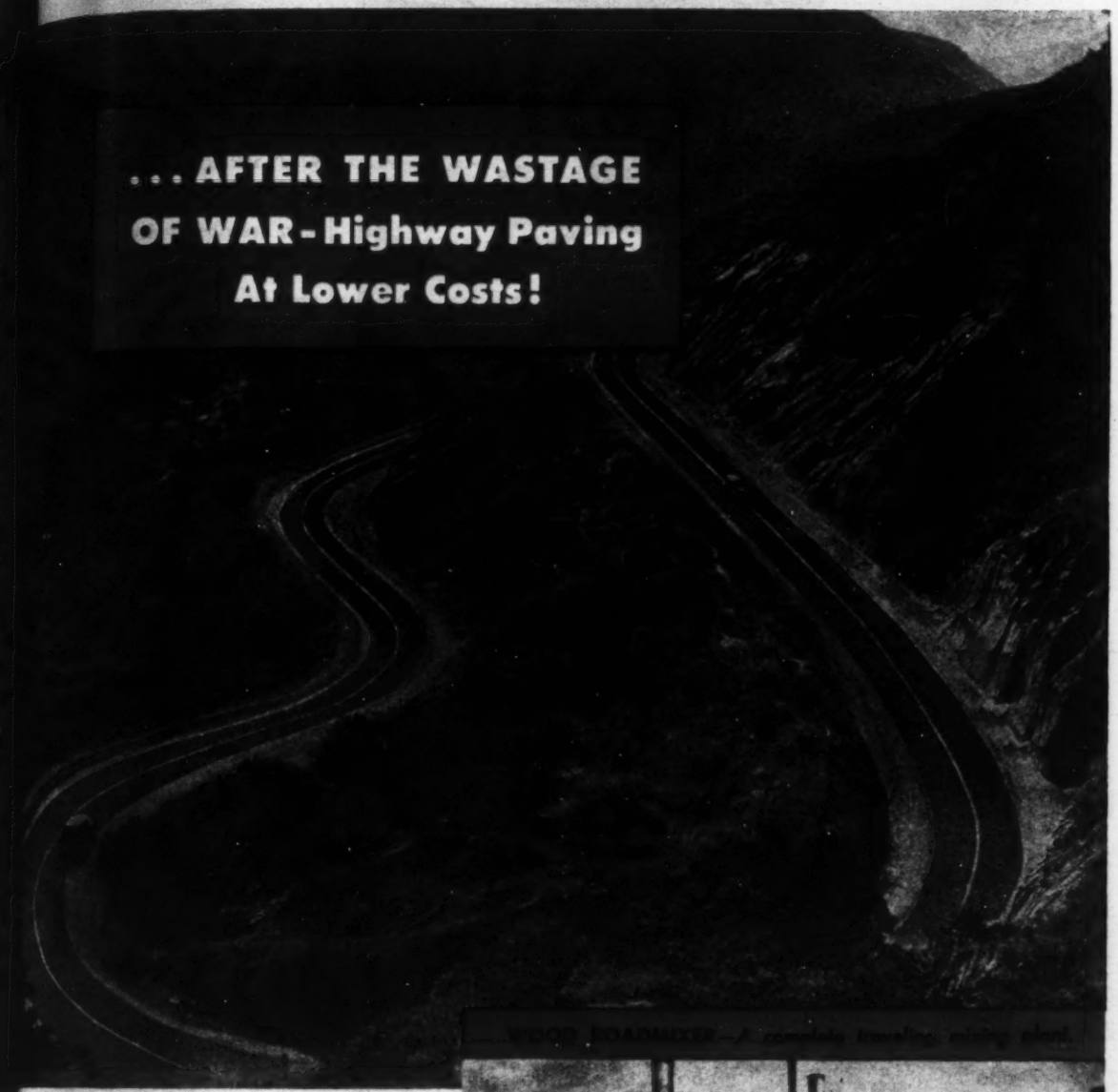
Earth-Moving Equipment—Becau this new book contains descriptions a actual operating views of off-the-hi way hauling units from construct and mining jobs in many parts of t country, it will be of interest to contr tors and other users of such equ ment.—*The Euclid Road Machine Co., Cleveland 17, Ohio.*

Underwater Cutting and Welding—This booklet opens with a brief st of the history of the processes scribed. H. L. Ingram, Jr., the auth tells of the techniques used for b torch and carbon arc cutting a metallic arc welding underwater, a lists pressure tables for torch cutti at various depths and tip sizes cutting materials from ¼ to 2 thick.—*Air Reduction, 60 East 42 Street, New York 17, N. Y.*

Valve Rebuilding—"How to Rebu Worn Valves by Hardfacing" is t title of a 12-page book of special terest to fleet operators and othe whose maintenance problems ha been aggravated by inability to obta replacement valves for internal co bustion engines.

The book groups worn valves in three classes—those not badly burn or guttered; those which have t faces too badly guttered, pounded burned to permit reclamation by grin ing, and those which have deep burned areas, gutters and cracks. M of the text of the book deals wi reclamation of the latter two group which ordinarily would be replace by building up the worn faces a other areas with special hardfacin material applied by means of t oxyacetylene torch. Complete instru tions are given for cleaning and

. . . AFTER THE WASTAGE OF WAR - Highway Paving At Lower Costs!



WOOD ROADMIXER—A complete traveling mixing plant.

Wood Roadmixers, the world's pioneer and leading traveling plant method of pavement construction, are furnishing dollars-and-cents evidence that top quality highways can be built for as little as one-third the cost of usual methods. The Wood Roadmixer permits the use of native or local materials, proportioned and mixed *on the job*. The Wood Roadmixer allows complete flexibility in the design, preparation and finish of job. Designers, engineers and contractors are discovering that Wood Roadmixers produce better paving faster and at less cost. More and more jobs are being designed for road-mix—and built by Wood Roadmixers.

Meet tomorrow's demands for *top quality, low cost* pavement construction. *Economy must become the national watchword!* Get the complete story of the Wood Roadmixer . . . Write for literature and costs.

WOOD ROADMIXER

You can't drive it in with a paint brush

DRIVING PRESERVATIVE DOWN into the fibers of a piece of wood takes more push than a brush can produce. People make buckets, boats and barrels out of wood because it resists penetration by liquids. *Penetration* means the difference between real treated lumber—pressure-treated lumber—and lumber that has only been painted with or dipped in preservative. Decay and termites work through thin films of poison in a short time.

THAT'S WHY Wolmanized Lumber* is given the kind of treatment vital to dependably long service life—vacuum-pressure impregnation in heavy steel cylinders. When the Wolman Salts* preservative is driven deep into the wood, "fiber-fixation" holds it there, preventing leaching and loss of protection.

WOLMANIZED LUMBER has an enviable performance record. Among typical cases reported in the booklet, "Service Records for Wolmanized Lumber", are laundry, bakery, paper and textile mill installations, bridges, railroad and mine structures. For a copy for reference in studying the worth of treated wood for your construction, write American Lumber & Treating Company, 1649 McCormick Building, Chicago 4, Illinois.

*Registered trade marks

WOOD THAT'S Alloyed FOR SAFETY AND ENDURANCE

AMERICAN LUMBER & TREATING COMPANY

spection of the valves for crac
preparation for hardfacing, appli
tion of the hardfacing metal and f
ishing. Illustrations show the b
methods of performing the vari
operations.—*Air Reduction, 60 E
42nd Street, New York 17, N. Y.*

Power and Heat Regulation—A b
letin describes a device to maintain
desired electric power or heat inp
or flow of liquids or gases to a
process or equipment.—*Wheelco I
struments Co., Chicago 7, Ill.*

Diesel Engines—Power users int
ested in the reasons for the flexibil
and dependability of diesel engines
what makes them stand up under t
heavy tasks commonly given them
will find a concise, simple explan
tion in this booklet. It has acti
pictures and drawings illustrating t
features which bring top performan
low-cost operation, and long life
diesel tractors, motor graders and e
gines. Seals and filters, the fuel sy
tem, lubricating oil and water cooli
systems, starting engines and oth
features are shown in drawings a
photographs, and are clearly describe
—*Caterpillar Tractor Co., Peoria, I*

"One American Business"—This
a bound volume of 144 pages descri
ing the history and operation of
successful company manufacturi
products of great value in the w
effort and in peacetime production.
Hyster Co., Portland, Ore.

Tap Reconditioner—The rugged ne
improved tap reconditioner on whi
all operations necessary for keepi
taps in "top" condition can be quick
and accurately performed is describ
in a 4-page folder now available.
*Detroit Tap & Tool Co., 8432 Bu
Avenue, Detroit 11, Mich.*

Power Plant Service Booklet—T
is a compilation of ten non-technic
discussions by authorities on ste
generating. Each handles a differe
phase of power plant operation a
supplies much useful information th
executives ought to have, yet rarely f
time to acquire.

It opens up matters not often broug
to executives' attention—for, examp
whether steam producing costs shou
be correctly classed as overhead or
item of product cost.

It discusses steam-producing equ
ment; modern installation and pr
tice; operating economies; boiler e
ciencies; potential heat vs. produc
steam, and other such pertinent s
jects.—*Preferred Utilities Mfg. Cor
1860 Broadway, New York 23, N.*

WRITE US

If you've ever had clutch trouble

You'll want to know more about the clutch that controls power by air pressure—the Fawick Airflex Clutch.

It works without arms or levers or toggles or springs. No moving parts—nothing to lubricate or adjust. Low maintenance expense. Misalignment corrected automatically.

This new type of clutch just can't cause any of the conventional clutch troubles.

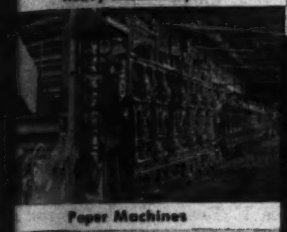
Proof? Certainly—in thousands of naval and merchant marine Diesel drives—in heavy duty drives for all kinds of machinery with tough jobs to do!

If you need a *trouble-free* Clutch, Brake or Flexible Coupling, our engineering department will be glad to make recommendations.

Heavy Machinery

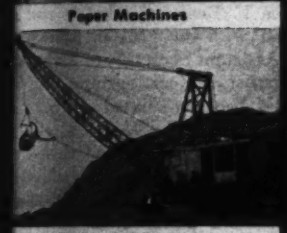
Destroyers — Tugs — Landing Craft

Rubber Mills



Paper Machines

Diesel Drives



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Oil Field Machinery

Mine Hoists

Steel Mills

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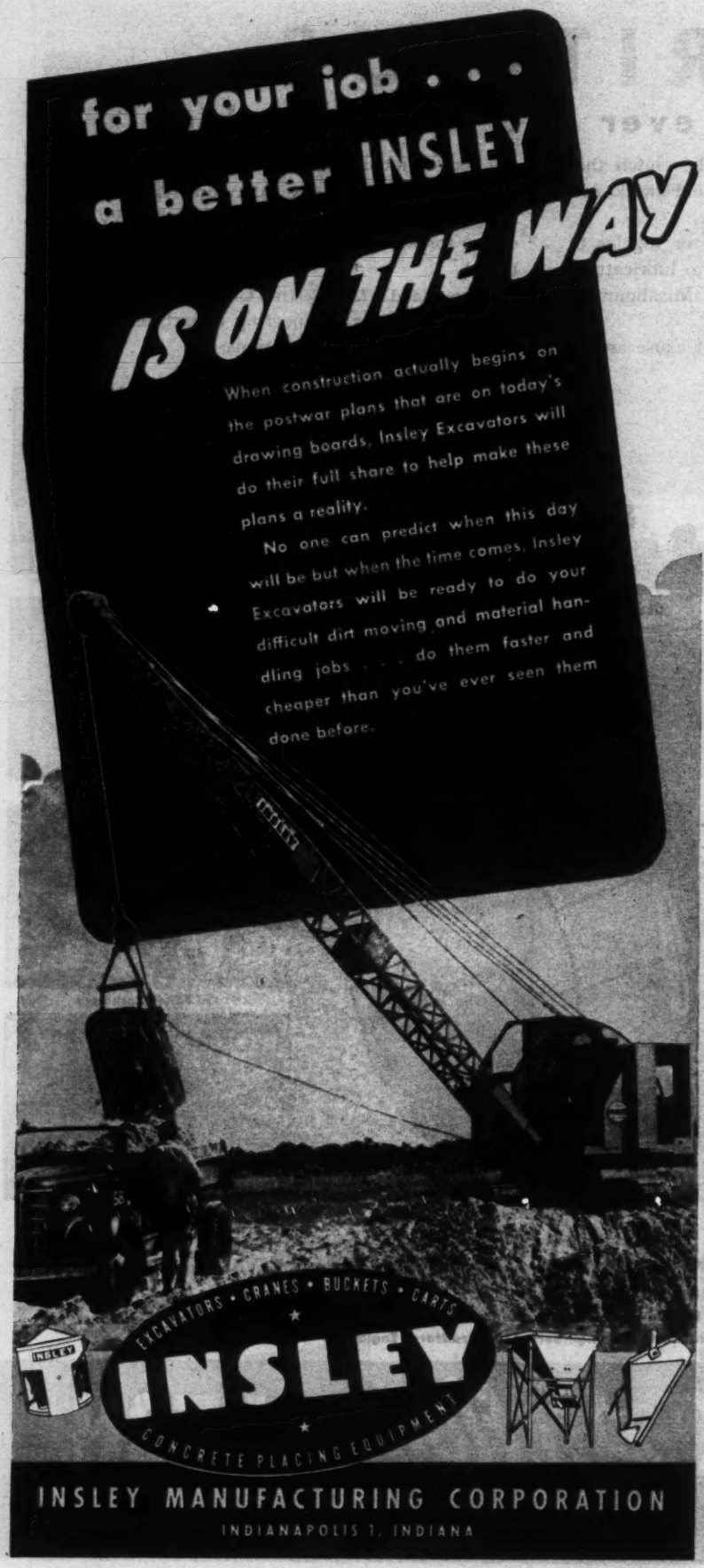
In Canada, Ronald-Coventry Ltd., Montreal, Toronto, Vancouver
In Britain, Crofts Engineers, Ltd., Bradford, England

FAWICK *Airflex* CLUTCH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a better INSLEY
IS ON THE WAY
When construction actually begins on the postwar plans that are on today's drawing boards, Insley Excavators will do their full share to help make these plans a reality.
No one can predict when this day will be but when the time comes, Insley Excavators will be ready to do your difficult dirt moving and material handling jobs . . . do them faster and cheaper than you've ever seen them done before.
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MEN AND JOBS

Ellwood H. Aldrich, consulting engineer, New York, formerly of the partnership of Newsom & Aldrich, has become associated as Planning Engineer with the Water Works Service Company, Inc., recently established as the operating and engineering organization for the water works properties of the American Water Works & Electric Company, Inc.

W. D. Faucette, new executive representative of the Seaboard Railway, Norfolk, Va., was chief engineer for over 31 years—from Jan. 1, 1913 to June, 1944.

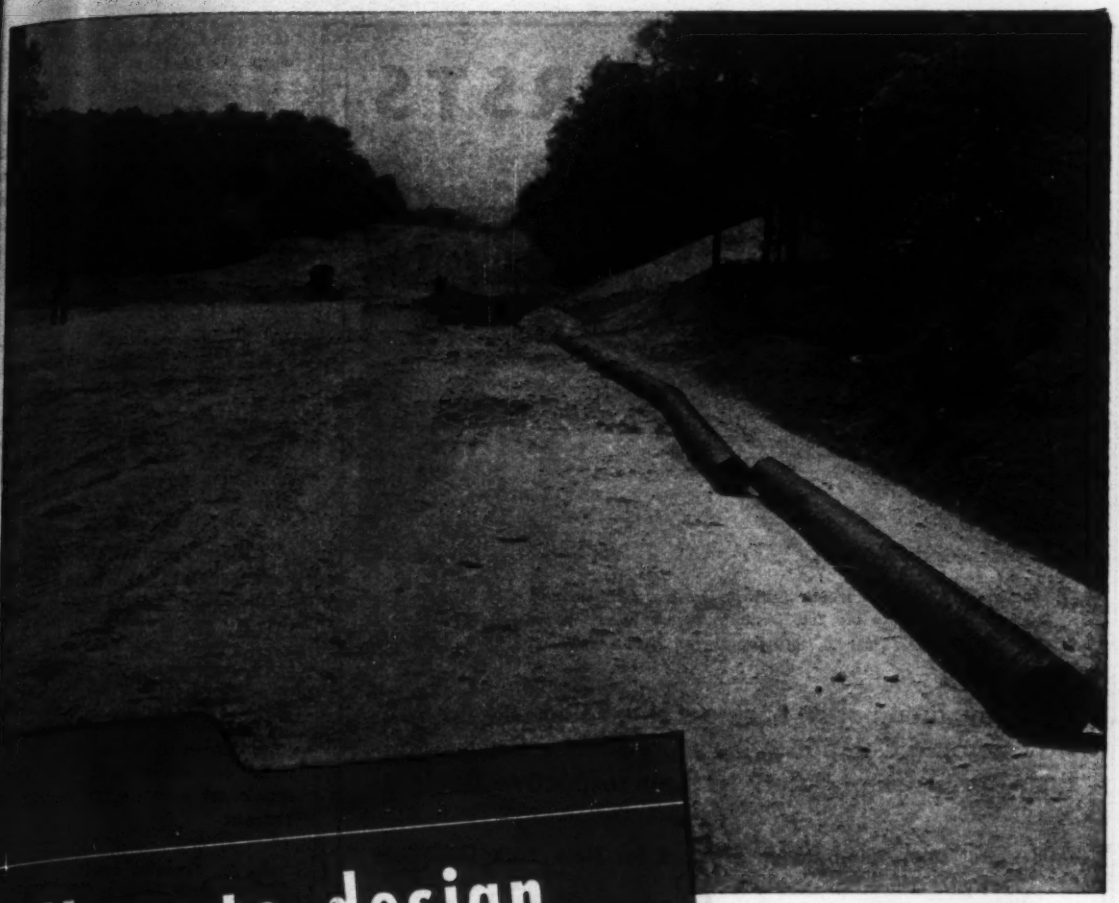
Capt. B. W. Ingram, plant engineer of the Savannah, Ga., district of the Army Corps of Engineers, has been placed in charge of a plant engineer office just opened at Winston-Salem, N. C.

Jesse B. Gilmer, assistant administrator of the Farm Security Administration, has been placed in charge of water programs which the FSA administers for the Department of Agriculture in 17 Western States. Gilmer succeeded Charles F. Brannan, who resigned his position with the FSA in April to become Assistant Secretary of Agriculture.

A native of Rock Springs, Tex., Gilmer has been associated with rural rehabilitation work since 1934, when he received a degree in civil engineering from New Mexico A. & M. College. He handled FSA's water programs in the Southwestern plains area. In 1940 he was appointed assistant regional director with headquarters at Amarillo, Texas, and in 1942 he became regional director. He was made assistant administrator in 1943.

Richard C. Batley has been appointed director of the Bureau of Waters and chief engineer of the Water and Power Resources Board, Pennsylvania Department of Forests and Waters. Mr. Batley entered the service of the Commonwealth in 1912 and in recent years has had charge of the large flood-control activities of the department.

Capt. G. R. Brooks, USN, has been assigned to the Marine Air Station at Cherry Point, N. C., as naval officer in charge of construction, succeeding Capt. **I. A. Bickelhaupt,** who has been transferred to the Fifth Naval District with headquarters at Norfolk, Va. Captain Brooks served as a naval officer in charge of construction at the Naval Air



How to design Post-War Subdrains

Installing 18,000 ft. of 8-in. ARMCO *Hel-Cor Perforated Pipe on the new Philadelphia road in Cecil County, Md.*

★ ★ ★

w highways after the war will be ilt differently. If road builders ofit by the experience of pre-war ghway break-ups and airport run- y troubles, the new roads will built on dry, stable foundations. That means adequate subdrains l more work for the contractor. rm drainage methods and blind ins will not do. Modern roads ll require designed subdrains nsisting of: (1) a trench deep ough to intercept all the water be- fore it reaches the roadway, (2) a graded backfill (not too large) that will keep out silt, (3) a perforated corrugated metal pipe that resists impact, vibration and disjointing, and (4) an adequate outlet.

Because of the light weight, long lengths, few joints and absence of breakage of ARMCO Perforated Pipe, the contractor can install it quicker and easier and can bid it at less cost per foot installed. Good drainage is costly only if it is omitted. Ask for literature on Designed Subdrainage. Address: Armco Drainage Products Association, 185 Curtis Street, Middletown, Ohio.

HELP FINISH THE FIGHT— WITH WAR BONDS

ARMCO Perforated Pipe

FAMOUS FIRSTS

The above picture of Irving Subway Grating, published in a N. Y. City newspaper early in the 20th Century, was entitled "An Isle of Safety" 35th St. and Broadway, N. Y. City

In the evolution of its business since 1902, **Irving Subway Grating Company** has scored these outstanding firsts—all **Isles of Safety** in their respective fields:

1908—First open steel mesh Gratings for New York City Subways.

1912—First open steel mesh Flooring for Industrial Plants (Solvay Process Co., Syracuse, N. Y.)

1916—First open steel mesh Armoring for Heavy Duty Concrete Floors (our own Forge Shop).

1917—First open steel mesh Gratings for Ships (Navy Mine Sweepers Pusey & Jones, Wilmington, Del.)

1927—First to equip Freight Car Tops with open steel mesh Runways (Henry Ford's D.T.&I.R.R.)

1927—First Continuous Grating—one-piece for any length and width (Bryant & Chapman, Hartford, Conn.)

1929—First Steel Mesh Landing Mats offered the Navy Bureau of Aeronautics.

1932—First open steel mesh Decking for Bridges (University Bridge, Seattle, Wash.)

1940—First Portable Emergency Landing Mats accepted by U. S. Army Engineer Corps (Virgin Islands).

1943—First open steel mesh Roadway Armoring for Postwar Highways (test installation at Darien, Conn.)

IRVING SUBWAY GRATING CO., INC.

Main Office and Plant: 50-63 27th St., Long Island City 1, New York
Western Office and Plant: Foot of Park Ave., Emeryville 8, Calif.

Station at Corpus Christi, Tex., prior to being assigned to Cherry Point.

R. W. McColough has resigned as deputy minister of highways and public works for Nova Scotia. Mr. McColough, who has been on leave of absence while director of construction for the Munitions Department resigned to become general manager of the Duffern Construction Co., Toronto.

William V. Binder of Charlotte, N. C., graduate of Massachusetts Institute of Technology and a research engineer prior to entering the service, has been promoted to major at the Army Air Force Eastern Flying Training Command headquarters at Maxwell Field, Ala.

William Donald Hurst, has been named engineer of Winnipeg, Man., succeeding William Aldridge, who is retiring.

Guy E. Whitman, superintendent of the Goldsboro, N. C., water department, resigned recently to become city manager of Roxboro, N. C. He has been connected with the Goldsboro municipal government for the past 2 years.

E. S. Tisdale, sanitary engineer of the U. S. Public Health Service, has been assigned to head the Procurement and Assignment Service for Sanitary Engineers, War Manpower Commission in Washington, and replaces Capt. **David Smallhorst,** who at his own request, has been assigned to overseas duty.

Clinton G. Sykes has been appointed city engineer of Tucson, Ariz., succeeding the late R. E. Stallings. Mr. Sykes has been with the U. S. Geological Survey, the Imperial Irrigation District in California, and the U. S. Forest Service; and for the past two years was assistant area engineer U. S. Engineer Dept., engaged in military construction.

J. D. Sutphen, maintenance of way engineer of Southern Railway System subsidiaries, has been transferred from Asheville, N. C., to new headquarters at Charlotte, N. C.

Thomas F. Hubbard, associate in civil engineering at Johns Hopkins University, has been appointed an associate member of the Baltimore City Plan Commission by Mayor McKeldin.

E. L. Peters of Des Moines, Ia., who was formerly associated with the Brown Engineering Co., is now engaged independently as a consulting engineer with offices at 1057 32 St., Des Moines.

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MEETING THE NATION'S AUTOMOTIVE TRANSPORTATION NEEDS

One out of every four cars and one out of every three trucks now serving America and helping to maintain America's vital, war-winning transportation system—is a

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MEETING THE NATION'S AUTOMOTIVE SERVICE NEEDS

All signs indicate that more people go to Chevrolet dealers for service than to any other dealer organization. . . . That's why car owners and truck owners say—

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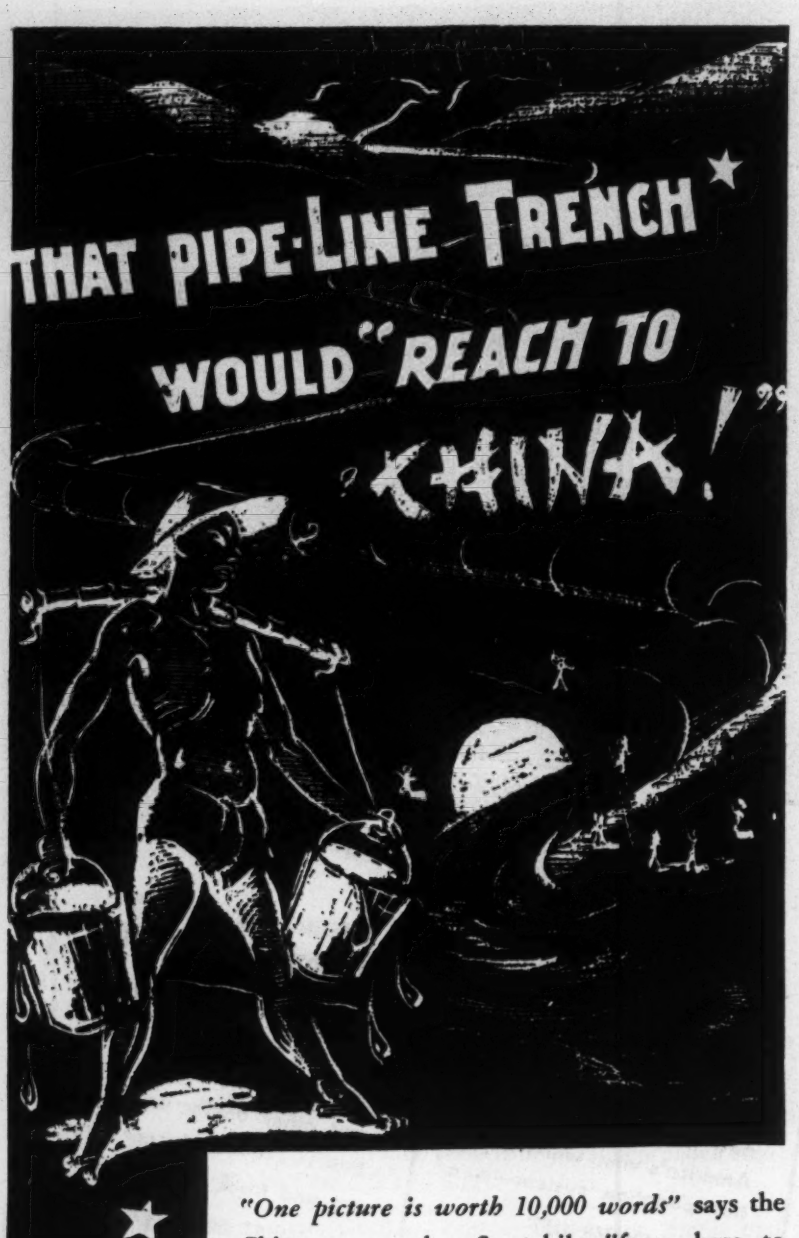

畫意能達萬言

"One picture is worth 10,000 words" says the Chinese proverb. So while "from here to China" may exaggerate a little, it should go a long way toward helping you realize the length of the really mammoth trench for pipe lines which would result if ALL the pre-drained STANG-DRIED Pipe Line Trenches were dug end-to-end! Truly a tribute to STANG WELLPOINTS performance. No more words needed!

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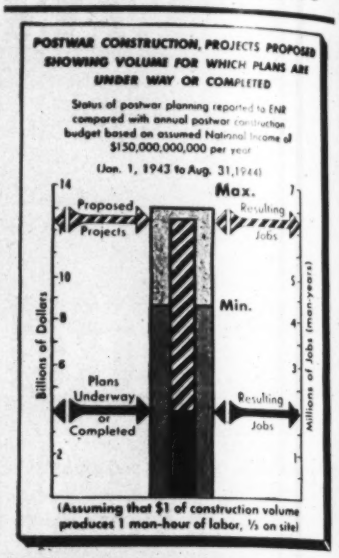
POSTWAR PROJECTS


POSTWAR CONSTRUCTION, PROJECTS PROPOSED SHOWING VOLUME FOR WHICH PLANS ARE UNDER WAY OR COMPLETED
Status of postwar planning reported to ENR compared with annual postwar construction budget based on assumed National Income of $150,000,000,000 per year
(Jan. 1, 1943 to Aug. 31, 1944)
Billions of Dollars
Millions of Jobs (man-years)
Max.
Min.
Proposed Projects
Resulting Jobs
Plans Underway or Completed
Resulting Jobs
(Assuming that $1 of construction volume produces 1 man-hour of labor, ½ on site)

Projects proposed for postwar construction have been published in these columns since January, 1943, as they have been reported to Engineering News-Record.

Statistics based on these reports are used by the Committee on Postwar Construction of the American Society of Civil Engineers to measure the progress of plans for postwar projects.

The chart above shows, both in estimated dollar volume and in jobs or man-years of labor, how fast this reservoir of future work is filling up.

If you or your community are working on projects that have not yet been included in this "postwar reservoir," please send us an itemized list and description of them, including estimated cost and the names of the engineers who are at work on the plans. Then as you watch the arrows climb you will know that you and your community are contributing to the success of the NUMBER ONE JOB of preparing for peace.

Address your projects list to Manager Business News Department, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

MINIMUM SIZE OF PROJECTS PUBLISHED

Public Works	$25,000
Industrial Buildings	40,000
All Other Buildings	150,000

WATER SUPPLY

PROPOSED WORK

La., Alexandria—City, exten., addn., to watermains, **$250,000.**

Mass., Lawrence—City, J. W. McCarthy, dir. Engineering, City Hall, water filtration plant, repairs to slow snad filter, new machine shop, installing float control valves, extend. city mains and dead connections. Over **$100,000.**

Mich., Detroit—Dpt. Water Supply, 735 Randolph St., addnl. installation ash handling equip. in plant in Waterworks Park, **$50,000.** L. G. Lenhardt, 735 Randolph St., supt.-genl. mgr.

Mo., Columbia—City, water tank, **$305,000;** boiler **$128,000.**

N. Y., Bear Mountain—Dpt. P. Wks., State Office Bldg., Albany, rehabilitation water supply and sewage disposal at Bear Mountain State Park, for Palisades State Park Comn., Conservation Dpt. **$125,000.**

N. Y., Carroll—Frewsburg Water Dist., Carroll, water supply sys. **$96,500.** State Aid Planning Funds allotted.

N. Y., New Hartford—Town, exten. water lines. **$100,000.** State Aid Planning Funds allotted.

N. Y., Vestal—Water Dist. 1, Vestal, water supply, pump. facilities, **$36,225.** State Aid Planning Funds allotted.

Tex., Baytown—Harris Co. Water Control & Imprvt. Dist. 7, Baytown, exten. water supply and lines. Over **$25,000.**

Tex., Houston—D. H. Canterbury, 7136 Lawndale St., waterlines and facilities for residential development project. Over **$25,000.**

★**Ont., Toronto**—City, J. J. Conboy, mayor, City Hall, water distr. and supply sys. **$4,206,983.**

Que., St. Lambert—Municipality, WW imprvs., filter bed, replacing 4 in. watermains by 10 in. mains, **$40,000.**

Bethlehem Steel for POST-WAR HIGHWAYS

It's going to be a huge post-war job, building the new highways needed by a growing America, carrying out hundreds of construction projects that had to lie fallow during the wartime years.

When the job begins, Bethlehem's complete line of highway products will again be at the service of road builders. Bethlehem road steels, backed by years of experience, have proved themselves—they're engineered all along the line for sturdy performance.

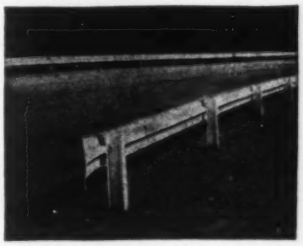
Plan to handle your post-war highway contracts by specifying this reliable source of supply for *all* road-steel products. Contractors can save time, bookkeeping and letter-writing by placing one order for all their needs for a given highway job with a conveniently-located Bethlehem warehouse. For full information about Bethlehem Road Steel Service, get in touch with the nearest district office, or write direct to Bethlehem Steel Company, Bethlehem, Pa.

BETHLEHEM STEEL

REINFORCING STEEL

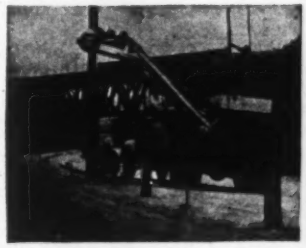
Bethlehem *Reinforcing Bars,* plain and deformed, are made of new billet steel in standard sizes and grades, and can be bent to shape and cut to size in most Bethlehem warehouses. *Bar Mats,* made of deformed bars clipped together, are easy and convenient to install, and lie flat. *Welded Wire Fabric* is fabricated from tough, cold-drawn wire to meet all standard highway specifications.

HIGHWAY GUARD



Bethlehem's beam-type guard rail, called the *Safety-Beam,* is made in standard 12 ft., 6 in. lengths, or if preferred, can be supplied in lengths up to 50 ft. *Cable Guard Rail* is durable three-strand steel cable, with a double-galvanized coating. *Highway-Guard Bracket,* made of high-tensile spring steel, is attached with one bolt to steel or wood posts, and supports three or four cables.

STEEL POSTS



Bethlehem *Steel Highway Guard Posts* are readily driven and have superior resistance to impact and side thrust. Bethlehem Steel *Highway Sign Posts* are wide-flange channel sections, punched with holes and pointed for easy driving.

STEEL PILING

Bethlehem *Steel Sheet Piling* for temporary or permanent retaining structures. *Steel H-Bearing Piles* for bridges, over- and under-pass, and other load-bearing structures.

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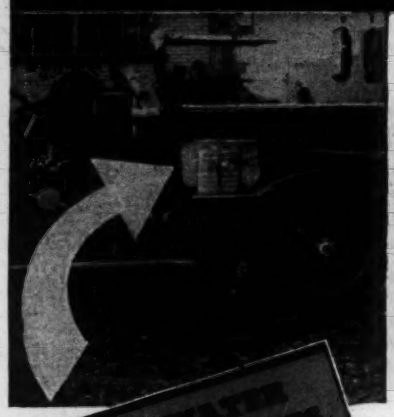
ROAD JOINTS — DOWELS — DOWEL BAR SUPPORTS
ROAD STRIP — WIRE ROPE AND STRAND — BAR TIES
GUARD RAILS — ANCHOR RODS — RIGHT-OF-WAY FENCE AND POSTS
PIPE — HOLLOW DRILL STEEL — DIGGING BARS
STRUCTURAL STEEL — STEEL CRIBBING MOLD BOARDS
REINFORCING FOR CONCRETE — BRIDGE FLOOR REINFORCING
CORRUGATED SHEETS — CONCRETE SLAB SPACERS
TURNBUCKLES — TIE RODS, SPIKES, BOLTS AND NUTS
TIMBER BRIDGE HARDWARE

INDIAN

CLEAR WATER

FIRE PUMPS



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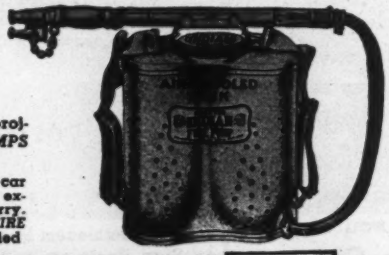

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POSTWAR PROJECTS (Cont'd.)

PLANS UNDERWAY

Fla., Gainesville—City, J. B. Mobley, mgr., plans completed water treatment plant, $133,000. CD 9/1—ENR 9/9.

Mass., Greenfield—Town, E. L. Bond, supt. Dpt. Streets & Engineering, Town Hall, plans 90% completed watermain extens., $108,000. Financing not yet provided for.

Mich., Adrian—City Water Bd., City Hall, plans 15% completed water treatment plant, $300,000. Finkbeiner, Pettis & Strout, 1010 Home Bank Bldg., Toledo, O., consult. engrs.

★**Mich., Detroit**—Dpt. Water Supply, 735 Randolph St., plans underway addnl. distr. mains in various sections city supplementing existing distr. mains. $930,000. L. G. Lenhardt, 735 Randolph St., supt.-genl. mgr.

Mich., Detroit—Wayne Co. Road Comn., 3800 Barlum Tower, 11 mi. 12 in. watermain furnishing water supply to Middle Rouge Parkway. $220,000. L. C. Smith, Wayne Co. Road Comn. engr.

Mich., Kalamazoo—City, retained Alvord, Burdick & Howson, consult. engrs., 20 N. Wacker Dr., Chicago, Ill., to draft engineering and architectural plans, central water plant. E. E. Norman, mgr. City Utilities.

Minn., St. Louis Park—Village, J. Justad, clk., City Hall plans completed deep well construction; $25,000 furnishing, install. pump. equip. $35,000; constructing 1,500,000 gal. steel or concrete reservoir, $60,000. J. C. Utton, village engr. CD 1/1—ENR 1/13.

N. J., Elizabeth—City, City Hall, plans extending water supply pipelines throughout city. $230,000. C. Collins, City Hall, engr.

O., Alliance—City, S. Kirkland, mayor, plans water distr. reservoir. $100,000. W. D. Sponseller, Alliance, engr. CD 9/1—ENR 9/9.

O., Barberton—City, R. K. Dobbs, mayor, City Hall, plans 25% completed 14 mi. water lines $180,000; plans four 1 m.g. filter beds, $260,000. Financed by Income Revenue Bonds. H. Bushey, City Hall, engr. CD 3/16—ENR 4/6.

O., Newark—City, plans underway WW imprvs., addnl. reservoir, force mains, $100,000. C. H. Wells, city engr.

O., Canton—Comrs. Stark Co., Hilda Schrantz, clk., Courthouse, plans 25% completed water, sewer and sanitation work, $140,000. Financing not yet provided for. L. K. Zerbe, Court House, engr.

S. C., Charleston—Comr. P. Wks., City Hall., plans completed imprvs., exten. WW, fire mains, storage tank, relining pipes and exten. main to reservoir, $340,000. J. E. Gibson, 14 George St., engr.

Tex., Waco—City, bond election soon, WW imprvs. $100,000. W. F. Smith, City Hall, engr.

Vt., Burlington—City, City Hall, WW imprvs., extens. $210,000. Financing not yet provided for. Geo. C. Stanley, city engr.

★**Wis., Shorewood**—Village, E. G. Teschan, mgr., 3930 W. Murray Ave., Z 11, water pump. station. $600,000. G. D. Simms, village engr.

Ont., Kitchener—City Clerk, 12 in. watermain in Shoemaker St., and 12 and 16 in. watermain, various streets. $58,000. M. Pequeqnat, c/o City, engr.

Ont., Woodstock—Municipality, 16 in. tee main, reservoir, well, miscellaneous WW imprvs., $41,400. J. R. Sullivan, Pub. Utilities Comn., engr. CD 2/4—ENR 2/24.

SEWERS, WASTE DISPOSAL

PROPOSED WORK

Conn., Middletown—City, A. P. Hull, chn. P. Wks. Comn., City Hall, sanitary sewers, various streets. Over $25,000.

Ga., Macon—City, sanitary sewers, $48,000. W. Walker, city engr.

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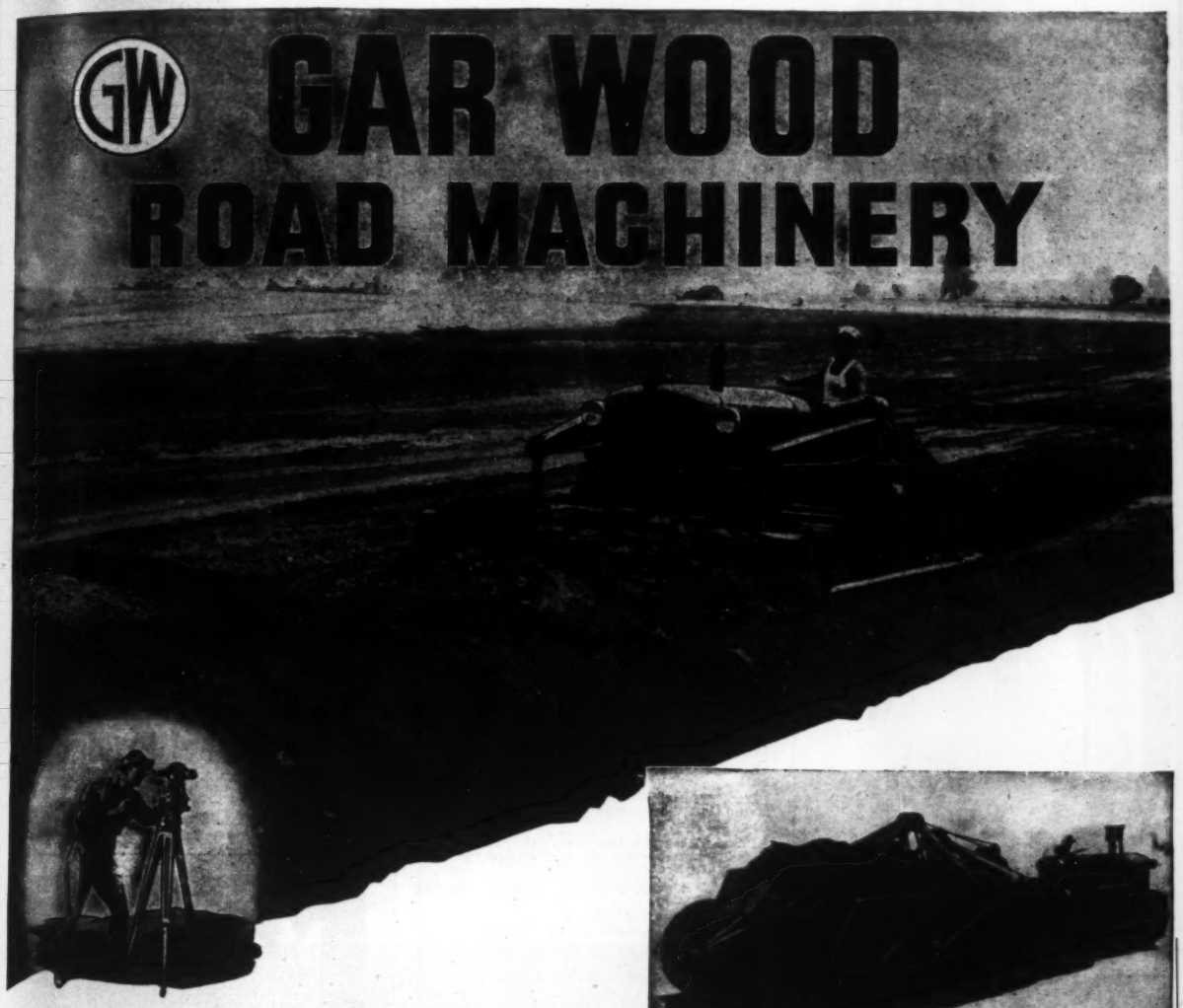

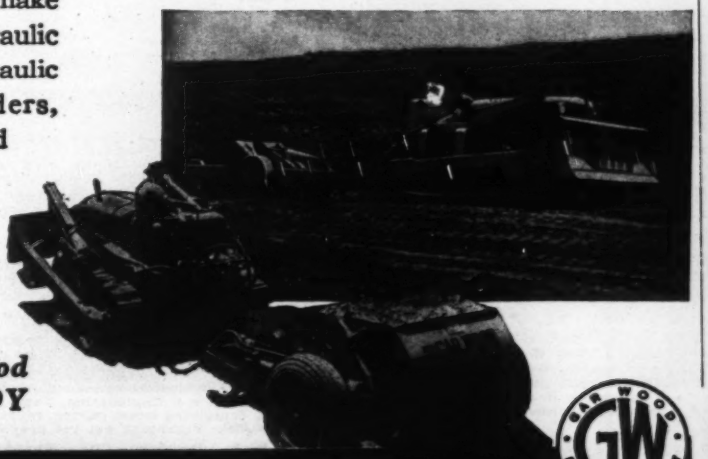

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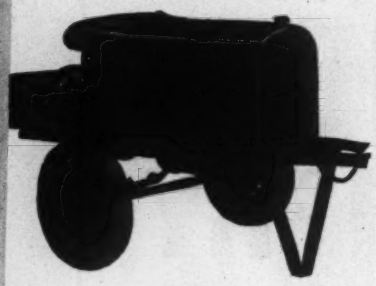

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POSTWAR PROJECTS (Cont'd.)

Ill., Cairo—City, reconstructing sewerage sys., combination storm and sanitary sewers. Over $300,000.

Ill., Cutler—City, K. Gemmill, mayor, City Hall, sewerage sys. $30,000-$40,000.

Mass., Greenfield—Town, E. L. Bard, supt. Dpt. Streets & Engineering, Town Hall, various sewage and drainage projects being studied. $100,000. Financing not yet provided for.

Mass., Lawrence—City, J. W. McCarthy, dir. Engineering, City Hall, preliminary survey 11,975 ft. sanitary sewers, $90,000; 5,740 lin. ft. surface water sewers, $46,240; incinerator, $185,000.

Mass., Leominster—City, Mayor La Pierre, City Hall, sewer and water line extens. in various streets, $50,000; stream clearance, Monoosnock Brook, $35,000.

Mass., Medford—City, W. Lawrence, mayor, City Hall, plans refuse incinerator. $125,000.

Mo., Columbia—City, storm and sanitary sewers, $231,000; garbage disposal, $52,000.

N. J., Gloucester City—City, sewage disposal plant. $650,000.

N. Y., Ballston Spa—Village, incinerator plant, $45,000; sludge digester installation $45,000. State Aid Planning Funds allotted.

N. Y., Ithaca—City, sewage treatment plant addn., $100,000; sewage collection sys., $250,000. State Aid Planning Funds allotted.

N. Y., Mt. Vernon—City, storm drain W. 4 St., $10,300; W. 2 St. from S. 10 Ave. to S. 12 Ave., $14,200; reconstruct sanitary sewer in E. First St. from First Ave. to Franklin Ave., $18,000; sanitary sewer W. 3 St., from S. 4 to S. 7 Aves., $16,000. State Aid Planning Funds allotted.

N. Y., Perry—Village, sewage treatment plant and incinerator, $90,000. State Aid Planning Funds allotted.

N. Y., Rome—City, imprv. sewage disposal plant, $60,000; construct incinerator, $50,000. State Aid Planning Funds allotted.

Tex., Baytown—Harris Co., Water Control & Imprvt. Dist. 7, Baytown, exten. sanitary and storm sewer lines. Over $25,000.

Tex., Grand Prairie—City, G. H. Turner, mayor, City Hall, enlarging sewage disposal plant. $100,000.

Tex., Harlingen—City, storm sewers, $100,000.

Tex., Houston—D. H. Canterbury, 7135 Lawndale St., sanitary lines residential area. Over $25,000.

★ **Tex., Port Arthur**—City, to vote $1,300,000 bond election soon drainage facilities for certain areas.

Wash., Aberdeen—City, sewage disposal plant. $200,000.

Sask., Wilkie—Municipality, T. A. Dinsley, clk., domestic sewer constr. $50,000.

PLANS UNDERWAY

Fla., Daytona Beach—City, plans will be completed soon sewage lines and treatment and imprv. existing sewerage sys. Smith & Gillespie Co., Packard Florida Bldg., Jacksonville, consult. engrs.

★ **Fla., Gainesville**—City, J. B. Mobley, mgr., City Hall, plans completed, storm and sanitary sewers, new street paving. $850,000. CD 9/2—ENR 9/9.

Ill., Centralia—City, City Hall, making surveys, storm sewers, $250,000, 2 year plan; sanitary sewer, exten. service mains, incl. receiving tanks and lift, $45,000, 3 year plan; plans 1¾ mi. sanitary sewer main to disposal plant. $65,000. B. H. Stover, city engr.

Ill., Westville—C. Byron, mayor, City Hall, plans 90% completed sanitary sewer drainage sys., and disposal plant, $150,000-$200,000. W. Fairhall, Danville, consult. engr.

Ill., West Frankfort—City, City Hall, sewage disposal plant. $100,000; exten. sewerage sys., $100,000. R. E. Vineyard, Browning Bldg., Benton, engr.

Ia., Woodward—City, J. Turner, Clk., City Hall, sewage sys., $25,000 to $30,000. Brown Eng. Co., Valley Bank Bldg., Des Moines, consult. engr.

★ **La., Alexandria** — City, exten. sanitary sewers, $50,000; abbattoir, $120,000; drainage and storm sewers, $1,800,000. Pan American Engineers, 912 Fifth St., Alexandria, consult. engrs.

Mass., Greenfield—Town, E. L. Bond, supt. Dpt. Streets & Engineering, Town Hall, plans 90% completed street paving, repairs, extens., $200,000. Financing not yet provided for.

Mich., Dearborn—City, Municipal Bldg., exten. interceptor and lateral sewers, $145,000. Land right not cleared and financing not yet provided sewage treatment plant addns., $200,000. F. H. Storrer, Municipal Bldg., engr.

★ **Mich., Detroit**—Dpt. P. Wks., City Hall, plans 10% completed Connor Pump. Station for storm water sewage to be electrically operated, incl. 500 cu. ft. per min. pump and 10,000 KVA transformer, $248,000; plans 25% completed 2.3 mi. 7 ft. 9 in. circular sewer

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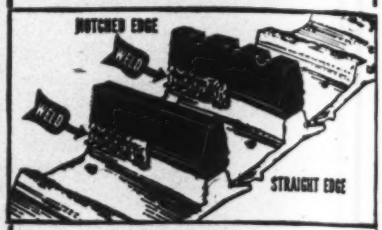

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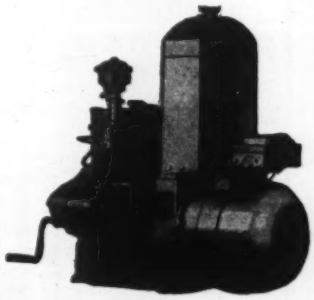

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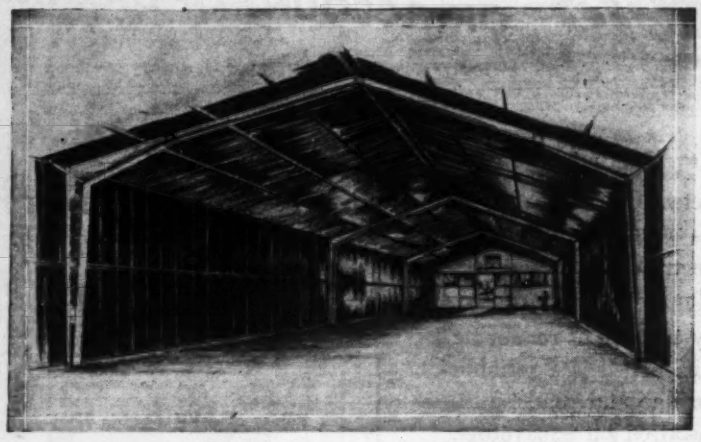

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POSTWAR PROJECTS (Cont'd.)

section with connections, manholes, etc., for River Rouge interceptor sewer, $1,490,000; plans underway river front sewers, between interceptor and Detroit River river-front, $1,000,000. Geo. R. Thompson, city engr. CD 3/30/43—ENR 4/1/43.

★**Mich., Detroit**—Dpt. P. Wks., City Hall, plans 58% completed concrete, vitr. concrete relief sewers with brick and concrete manholes Norfolk Ave., Hubbel to Mark Twain, $16,000; Conant Rd., Dan to Sullen, $27,000; St. Aubin Ave., Trombly to Horton Ave., $28,000; St. Aubin Ave., Palmer to Piquette and Dubois St., $32,000; Grandy Ave., Palmer to Piquette and Dubois St., $40,000; Grandy Ave., Trombly to E. of Grand Blvd., $19,000; Mt. Elliott Ave., Theodore St. to Ferry Ave., $28,000; Mt. Elliott Ave., Trombly to Griffin Ave., $20,000; Outer Dr., west of Eureka Ave., $12,000; Hamlet, west of Fenelon Ave., $35,000; Westchester, Conant Rd. to Harned Ave., $26,000; Hessel, Berg, Bentler to Pembroke Ave., $244,000; Plymouth Rd., W. Parkway to Rouge River, $72,000; W. Chicago Blvd., W. Parkway to Rogue River, $82,000; Tireman Ave-Parkland-Warren sewer from W. Parkway to Pierson Ave., $135,000; Warren Ave., W. Parkway to Parkland, $60,000; Grand River Ave., 7 Mile, Berg, Shiawassee, $6,000; miscellaneous sewer arms, $200,000. Geo. R. Thompson, City Hall, city engr.

★**Mich., Detroit**—City Dpt. P. Wks., City Hall, plans completed vitr. and concrete relief sewers with brick and concrete manholes Fullerton-West Parkway Sewer, Telegraph Rd. to Rouge River, $102,000; Oakwood Ave. Relief Sewer, Sanders to Pleasant Ave., $48,000; Lemay Ave Relief Arm, Freud to Jefferson Ave., $80,000; Eaton Ave., Greenlawn to Livernois Ave., $500; Freud Ave., Continental to Dickerson, $4,000; Otis Ave., Livernois to Hammond Ave., $20,000; Wildemere Ave., Montgomery to Northwestern, $20,000; Holmur Ave., Hazelwood to Joy Rd., $3,500; Dexter Blvd., Hogarth to Northwestern, $2,000; Linsdale, west of Livernois $800; Philadelphia Ave., Quincy to Holmur, $10,000; Fairview, North of Shoemaker Ave., $1,500; Wykes, north of Tireman Ave., $800; Moore Place, Whitewood to 30 St., $6,500; Anstell and Athens, north of Harper, $900; Chopin and Proctor, Panama to McGraw, $8,500; St. Martins and Meyers Rd., Wyoming Rd. to Pembroke Ave., $75,000; Fort St., Colvin to Solvay, $36,000; Cadet, Infantry to Cavalry Aves., $27,000; Mack Ave., Lenox to Chalmers Ave., $21,000; Quincy Ave., north of McNichols Rd., $1,500; Oakman Blvd., Grand River to Elmhurst Ave., $15,000; Puritan Ave., Fairview to Parkside Ave., $16,000; Buffalo Ave., Charles to Talbot Ave., $35,000; Van Dyke Ave., Outer Drive to Milbank Ave., $20,000; Raymond Ave., Edgewood to Grinnell, $6,000; Colonial and Ormand, Luther to Powell, $12,000; Lyndon-Cloverlawn to Livernois Ave. $50,000; Clayburn, north of Warren, $2,500; Sylvester, east of Cadillac, $1,200; Willette, Cicotte to Livernois, $3,500; Clarita, Sorrento to Steel, $1,800; Taylor, east of Third Ave., $1,800; Kentfield, south of McNichols Ave., $1,200; Dexter, north of Puritan, $3,000; Fairfield, Puritan to Florence Ave., $6,000; Charlevoix, east and west of Fischer, $6,000; Seminole, north of Harper, $1,500; Hurlbut, north of Jefferson, $3,000; Forest, Cadillac to E. of Hurlbut Ave., $3,000; Hern, east and west of Springfield Ave., $1,200; Georgia, between Sherwood and Concord Ave., $500; Alaske, Prairie to Central, $3,000; Devine, Anstall to Athens, $2,000; Hoover, Collingham to Eight Mile Rd., $2,200; Burnette, Van Buren to Alaske Ave., $4,500; Shoemaker and Chopin, McClellan to Cooper, $7,000; Dundee Ave. and Bostin Blvd., Grand River to Broadstreet, $26,000; Seneca, Georgia, Maxwell Aves., Harper to Erwin, $127,000; McClellan and May, Harper to Marcus, $53,000; Maxwell Ave., Hardyke to Georgia and Pressler, Maxwell to Van Dyke, $19,000; Trombly and Riopelle Sts., St. Aubin to E. Grand Blvd., $57,000; Essex Ave., Manistique to Ashland Ave., $1,800; Montevista, south of Chalfonte to Fenkell Ave., $6,000; Westfield, Hartfield to Littlefield Ave., $1,500; Clarita and Margaretta, west and west of Robson Ave., $3,000. CD 3/11/43—ENR 3/18/43.

★**Mich., Detroit**—Wayne Co. Drain Comn., 3505 Barium Tower, plans completed LeBlanc drain exten., $1,410,000; Milk River Drain, $1,225,500; installing concrete and concrete pipe storm water drains in Drainage Dist. 3, $536,137; installing concrete and concrete pipe for covered storm water drains, in Drainage Dist. 6, $3,360,197. Geo. A. Dingman, co. drain comr.

Mich., Fremont—City, preliminary plans underway sewage disposal plant incl. primary sedimentation, separate sludge digestion and recirculation filtration, $319,000. Francis Engr. Co., 204 Eddy Bldg., Saginaw, consult. engr.

Mich., Tecumseh—Village, J. Floyd Elliott, pres., plans 15% completed sewage treatment plant, $150,000. Pinkbeiner, Pettis & Strout, 1010 Home Bank Bldg., Toledo, O., consult. engrs.

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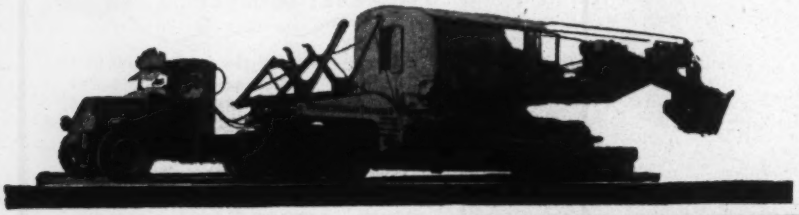

POSTWAR PROJECTS (Cont'd.)

Minn., St. Louis Park—Village, J. Jo clk., City Hall, plans completed trunk s connecting with Minneapolis-St. Paul sewage disposal sys., $200,000-$300,000. Utton, village engr. CD 7/1—ENR 1/11.

N. Y., Bayside—President Queens M. A. FitzGerald, comr. Boro Wks., 12 Queens Blvd; Kew, Gardens, Zone 15, underway storm sewer, Oceania St., 46 to 48 Ave., etc., (PQS-41), $215,000. W. Bertram, asst. engr. in charge sewers.

N. Y., Jackson Heights—President Qu Boro, M. A. FitzGerald, comr. Boro W 120-55 Queens Blvd., Kew Gardens, Zone plans underway combined sewer, 90 Grand Central Park to 23 Ave. etc., (39), $19,900. W. H. Bertram, asst. engr charge sewers.

N. Y., Jamaica — President Queens Maurice A. FitzGerald, comr. P. Wks., 12 Queens Blvd., Kew Gardens, Zone 15, underway storm sewer (second barrel), den Blvd., 157 to 155 St., etc., (PQS- $139,710; Linden Blvd., Marine Pl. to F ers Blvd., (PQS-5) $137,250; 155 St., 111 to 108 Ave., (PQS-6A) $179,200; comb sewer 153 St., 79 Ave. to Union Turn (PQS-8A) $9,200. State Aid Planning F allotted. W. H. Bertram, asst. engr charge of sewers.

★**N. Y., Jamaica**—President Queens M. A. FitzGerald, comr. P. Wks., W Bertram, asst. engr. in charge of Se 120-55 Queens Blvd., Kew Gardens, 15, plans underway storm sewers (se barrel), 95 Ave. from 150 to Brisbin (PQS-25) $129,700; Sutphin Blvd. fro Ave. to 139 St. etc., (PQS-26) $12 Jamaica Ave. from 152 to 153 Sts., (PQS-27), $100,650; Jamaica Ave. from St. to Woodhull Ave., etc., (PQS-20) $13 108 Ave. from 155 to 165 Sts., (PQS $225,200; 155 St. from 108 to 107 Aves., (PQS-24) $150,000; storm sewer, 150 St. Peck to 60 Aves. (PQS-18) $125,000; bined sewer 164 St. south of Goethals to Grand Central Parkway (PQS-21-A), 300. State Aid Planning Funds allotted.

N. Y., Jamaica—President Queens M. A. FitzGerald, comr. P. Wks., W Bertram, asst. engr. in charge of se 120-55 Queens Blvd., Kew Gardens, Zone plans underway combined sewer, U Turnpike south roadway, from 325 ft. of 135 St. to Grand Central Pkway., (PQS-10), $31,300; Union Turnpike from St. to Main St., (PQS-11), $8,100; U Turnpike from Vleigh Pl. to Grand Ce Pkway., (PQS-12), $14,900; storm and itary sewers, New York Blvd., Liberty Arden Aves., etc., (PQS-15-A), $42,500. Aid Planning Funds allotted.

N. Y., New York—President Manha Boro, W. D. Binger, comr. Boro Wks., Edwards, ch. engr. Bur. Hys. & Se Municipal Bldg., Zone 7, plans underway building drains, transverse road 3, 1,20 ft., Central Park (PMS-21), $40,000. Aid Planning Funds allotted.

N. Y., New York—President Manha Boro, W. D. Binger, chn. Boro Wks., Edwards, ch. engr. Bur. Hys. & Se Municipal Bldg., Zone 7, plans under sewers Vanderwater St., Frankfort to Sts., (PMS-441) $21,400; Murray St., We Greenwich Sts., (PMS-442) $26,700; M St., Broadway to Church St., (PMS- $18,200; Worth St., Broadway to Lafa St., (PMS-444), $15,100; Frankfort St., liam to Jacob Sts., (PMS-434), $27,800; St., John to Fulton Sts., (PMS-435), $17 Ridge St., Stanton to E. Houston Sts., (436), $17,100; Ludlow St., Rivington to ton Sts., (PMS-437), $15,350; Platt St., to William Sts., (PMS-438), $23,500; W St., Bway. to West Bway., (PMS-439) 250; Ferry St., Cliff to Pearl Sts., (PMS- $30,200; Bway., 32 to 33 Sts., (PMS $20,000; Vesey St., West to Chirch (PMS-16), $45,000; Fifth Ave., 79 to 94

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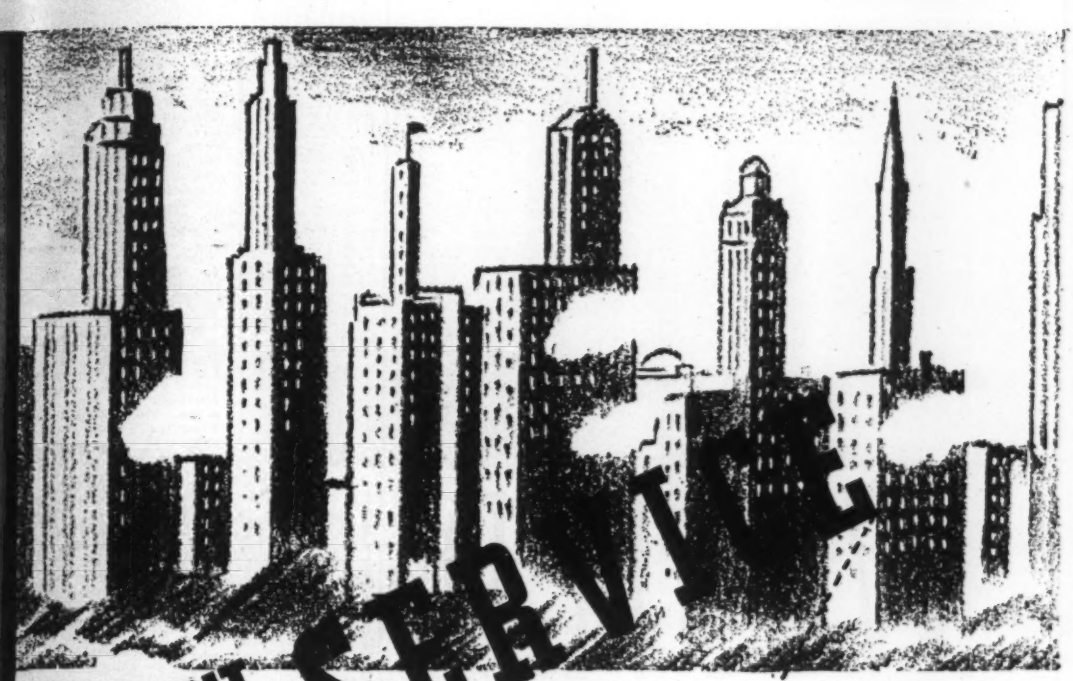

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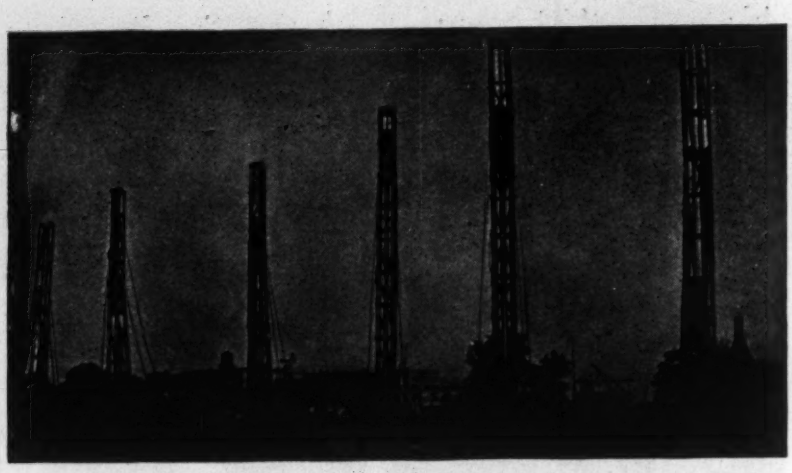

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POSTWAR PROJECTS (Cont'd.)

(PMS-20), $50,000; West St., between and Fulton Sts. (PMS-430), $51,400; 11 St., 6 to 7 Aves., (PMS-421), $ Beaver St., William to Wall Sts., (PM $26,250; Cedar St., West to Greenw $25,250. State Aid Planning Funds a CD 2/4—ENR 2/24.

N. Y., Ozone Park — President Borough, M. A. FitzGerald, comr. P Borough Hall, 120-55 Queens Blvd. Gardens, Zone 15, plans underway sewer North Conduit Ave., from 146 of 132 to 125 Sts., etc., (PQS-1) combined sewer 133 Ave. from 121 Sts., etc., (PQS-13) $29,850; sanitary North Conduit Ave. from 55 ft. south to 129 Sts., etc., (PQS-16-A), $22,400 going in South Ozone Park. State Aid ning Funds allotted. W. H. Bertram engr. in charge of sewers.

N. Y., St. Albans—President Queens M. A. FitzGerald, comr. P. Wks., Bertram, asst. engr. in charge of s 120-55 Queens Blvd., Kew Gardens, Z plans underway storm sewer (second Dunkirk St. from Brinkerhoff to 1 Aves., etc., (PQS-119), $190,900. Sta Planning Funds allotted.

N. Y., Springfield Gardens—Pr Queens Boro, M. A. FitzGerald, comr Wks., 120-55 Queens Blvd., Kew Ga Zone 15, plans underway sanitary 144 Rd. from Farmers Blvd. to 96 ft of 169 St., etc., (PQS-40), $17,100. Bertram, asst. engr. in charge sew

O., Alliance—City, S. Kirkland, City Hall, 10 mi. storm water sewers, 000. W. D. Sponseller, city engr.

O., Barberton—City, plans 5% com storm sewers various locations. Financed by Revenue Bonds. H. Bunker Hall, engr. CD 12/10—ENR 12/16.

★**O., Fostoria**—City, H. M. Wanner dir., plans 25% completed, rep imprv., exten. sewerage sys. $500,000 bond election Nov. 7. CD 7/20—ENR

O., Marion—City, plans completed ft. 18 in. sanitary interceptor sewer, T. C. Cathers, city engr.

★**O., Middletown**—City, F. Schatzma ing city mgr., City Hall, plans 5% pleted revising sewerage sys., constr larger lateral sewers west of Main S sewage disposal plant, $2,500,000; con ing various small sewer projects, $ Bull's Run Sewer Project at Upper Ark $300,000. L. P. Diffenbach, City Hall engr. CD 3/16—ENR 4/6.

O., Painesville—Comrs. Lake Co., Spaulding, clk., Court House, sewer water sanitary facilities. $430,000. Fin not yet provided for. A. B. Wilson, House, co. engr.

★**Pa., Rochester**—Beaver Co., Beaver erage sys. $593,600. Financing n provided for. M. J. Baker, Jr., Roch consult. engr.

R. I., Warren—Town, F. Brochu, Sewer Comn., Town Hall, sewerage imprvs. Over $50,000. Metcalf & Eddy Statler Bldg., Boston, Mass., consult.

Tex., Waco—City, bond election soon itary sewers. $150,000. W. F. Smith, Hall, engr.

★**Vt., Burlington**—City, City Hall, sa sewers, $670,000; storm sewers, $ Financing not yet provided for. G Stanley, city engr.

Wash., Auburn—City, sewage di plant with trunk lines, laterals. $60,000. Fallgreen, City Hall, city engr.

Wash., Grandview—City, plans und primary sewage treatment plant. G. D. Hall, Larson Bldg., Yakima, c engr. G. Douglas, city engr.

Wis., Antigo—City, S. B. Byrne, clk., itary and storm sewers, $25,000; sa disposal, $70,000. H. Olk, city engr.

Wis., Elkhorn—City, E. E. Lawrence, storm sewer $3,000; sewage tr. plant, $ J. M. Biagi, city engr.

Wis., Portage—Mrs. Frances Wright, clk., City Hall, altering and constru sewage tr. plant addn. Est. $25,000. G Eng. Co., Portage, engr. CD 8/18—ENR

★**Wis., West Allis**—City, 7525 W. G field Ave., Z. 14, street imprvs. $1 P. Burbach, city engr.

Ont., Galt—City, C. T. Chesney, clk., age disposal plant, about $75,000. Pr & Redfern, 36 Toronto St., Toronto, engr

★**Ont., Ottawa**—Municipality, plans u way sewage disposal plant near range. $4,000,000. F. C. Askwith, T portation Bldg., Comr. Wks. and engr.

BRIDGES

PROPOSED WORK

Ark., Fort Smith—Sebastian Co., Smith, constructing bridge on Browns Nillard Rd., $27,300; hy. bridge in Green Dist., $145,900.

Conn., Guilford—Town, L. I. Dudley, Selectman, Town Hall, concrete bridge, board Hill, $25,000.

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POSTWAR PROJECTS (Cont'd.)

Ind., Mishawaka—City and St. Joseph C heavy duty bridge over St. Joseph Ri $75,000.

★**La., Alexandria**—City, bridge over Ba Rapides on Fourth St. Intersection, 000; railroad underpasses for Monroe, Ja son, Murray and Lee Sts., $500,000.

Mass., Greenfield—Town, E. L. Bond, Dpt. Streets & Engineering, Town Hall, eral bridges. Over $100,000. Financing yet provided for.

Mass., Lawrence—City, J. W. McCar dir. Engineering, City Hall, 40 ft. clear concrete bridge over Shawsheen River, No Parish Rd. $35,000.

New Hampshire—State Hy. Dpt., Conc 0.4 mi. rein-con. highway bridge, approac in Conway, $102,000; 0.5 mi. surface trea gravel road on bridge, in Bartlett, $64,0 concrete bridge, bit. treated gravel proaches, at Andover, $112,000.

New Hampshire—State Hy. Dpt., Conc 3 rein.-con. hy. bridges, Bethlehem-Car Hy., Bethlehem and Carroll. $200,000.

★**New Hampshire**—State Hy. Dpt., C cord, 8 mi. bridge and highways Fitzwilliam, $500,000; rein.-con. hy. br and approaches, in Cornish, $55,000; crete, steel bridge, in Meredith, $150,0 concrete hy. bridge, in Lyme, $25,000.

N. Y., Fonda—Comrs., Montgomery replacing 15 county bridges, $112,000. Aid Planning Funds allotted.

PLANS UNDERWAY

Ill., Centralia—Div. Hys., Springfield, way, combination vehicular and pedestr under 2 St. where C. B. & Q., Illinois C tral, Southern and Missouri Pacific Railro cross, $400,000. W. W. Polk, Springfi ch. hy. engr.

N. Y., New York—President Manha Boro, W. D. Binger, comr. Boro Wks., D Edwards, ch. engr. Bur. Hys. & Sew Municipal Bldg., Zone 7, plans under East River Dr. pedestrian Overpasses a 11 and Delancy Sts., (PMS-10), $150,0 parapet wall E. 14 to E 18 Sts., $15,0 pedestrian sidewalk and overpasses on W Side Elevated Hy., (PMS-11), $200,000. Aid Planning Funds allotted.

N. Y., Yorktown—Dpt. P. Wks., Alb preliminary plans, Con. 80- grade elim tion at Taconic State Parkway and Unde Ave. for Taconic State Park Commission, C servation Dpt. $100,000. Sanborn, patrick & Murphy, 101 Park Ave., New Y Zone 17, consult. engrs.

O., Barberton—City, R. K. Dobbs, ma City Hall, plans 5% completed repai viaduct on E. Tuscarawas Ave. and Woo Rd. bridge. $90,000. Financing not yet vided for. H. Bushey, City Hall, city e CD 12/10—ENR 1/13.

★**O., Jefferson** — Comrs., Ashtabula Jefferson, bridge over Grand Ri bridge over Ashtabula River in Cree Gulf, $750,000. C. O. Topper, Court Ho co. engr.

★**O., Mansfield**—Comrs., Richland Co., Henry, clk., Court House, plans completed, bridges, viaducts, grade sep tions, $1,830,000. Financing not yet pro for. H. C. Sword, Court House, co. CD 3/20—ENR 4/6.

★**O., Middletown**—City, F. Schatzman, ing city mgr., City Hall, plans 5% c pleted, underpass either at Nelbar or Ca St., crossing of Big 4 R.R. $600,000. Fin ing not yet provided for. L. B. Differb City Hall, city engr.

O., Painesville—Comrs. Lake Co., E Spaulding, clk., Court House, repairing ious bridges, $25,000. A. B. Wilson, C House, engr.

★**O., Springfield**—City, A. J. Dillon, City Hall, plans 5% completed viad over Buck Creek, on Limestone St., $300, new bridges over Penna. R. R. tracks Wittenberg & Lowry Aves., 6 bridge Park Blvd. in Snyder, Fountain Ave. L stone and Sherman Aves., $940,000. Fin ing not yet provided for.

★**Pennsylvania**—State Hy. Dpt., c/o J Shroyer, secy., Harrisburg, 5,150 ft. b spanning Susquehanna River from Le St. in Lemoyne to Iron Alley in south risburg, Cumberland and Dauphin Cou $5,150,000. Financing not yet provided C. H. Buckius, ch. engr.

★**Pennsylvania**—State Hy. Dpt., c/o J Shroyer, Harrisburg. Fallston B across Beaver River, $2,525,000, land r not yet cleared; 37 St. bridge imprvs., 000. Financing not yet provided for Rochester-Bridgewater Bridge, exten River Blvd. and attendant interchang east and west end of bridge, grade c and structure adjustments to facilitate traffic movement and remove flood inte ence danger, $214,000. M. S. Baker, Rochester, consult. engr.

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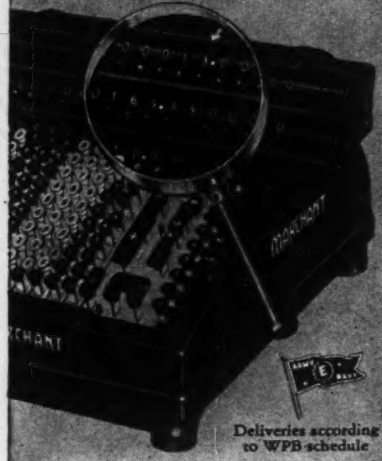

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POSTWAR PROJECTS (Cont'd.)

Tex., Waco—City, bond election soon, new bridge across Brazos River. **$100,000.** W. F. Smith, City Hall, engr. CD 6/1—ENR 6/15.

STREETS AND ROADS

PROPOSED WORK

★**Ark., Fort Smith**—Sebastian Co., R. P. Stroxier, judge, Fort Smith, Constructing imprv. roads, **$941,700**; roads in Greenwood Dist., **$782,400.**

Ark., Fort Smith—City, paving streets. **$183,950.**

Ill., Cairo—Alexander Co., Court House, 7 mi. black top road connecting F.A. 144 and S.B.I. 3, beginning at Tamms and ending at Olive Branch, **$60,000.** D. Ball, co. supt. hys.

Ill., Cairo—City, street paving, **$75,000.** D. Ball, co. supt. hys.

Ind., Michawaka—St. Joseph Co., St. Joseph, paved hy. around suburbs for heavy traffic, **$250,000.**

★**La., Alexandria**—City, street paving, imprvs., **$2,333,000**; reconstructing curb heights to lower grades, **$149,000.**

Mass., Lawrence—City, J. W. McCarthy, dir. Engineering, City Hall, preliminary surveys 21,200 lin. ft. concrete curbing, **$21,200**; 40,300 sq. yd. bituminous macadam paving, **$60,450**; removing 11,610 lin. ft. car rail Essex St. and Bway., and bituminous concrete pavement over granite blocks 64,970 sq. yd., **$58,500**; existing bituminous macadam pavement repairs 16.48 mi., **$80,500**; imprv. 1,984 lin. ft. Barker St., incl. concrete curbing, walks, tree planting, bituminous macadam paving, retaining wall, **$27,680**; imprv. 4,256 lin. ft. marginal streets along Spicket River, Erving and Marión Aves., incl. land damages, concrete curbing, walks, etc., **$56,430.**

★**Mass., Leominster**—City, Mayor La Pierre, City Hall, 12 mi. permanent road work. **$600,000.**

★**Mass., Medford** — City, W. Lawrence, mayor, City Hall plans bituminous macadam and concrete resurfacing, repairing 70 mi. various streets. Over **$500,000.**

★**New Hampshire**—State Hy. Dpt., Concord, surveys surface treated graveling 12 mi. road Wilmot to Enfield, **$700,000**; 1.5 mi. Stratford, **$50,000**; road mix 7.6 mi. Sandwich to Tamworth, **$350,000**; road mix 8.5 mi. and small bridge Wakefield, **$475,000**; 4 mi. Rumney, **$230,000**; road mix 9 mi. Pittsfield and Barnstead, **$350,000.** Financing not yet provided for.

★**New Hampshire**—State Hy. Dpt., Concord, constructing highways, incl. surface treated gravel, bituminous macadam, concrete in Keene, Surry, Hillsboro, Henniker, Westmoreland, Orford, Lancaster and Northumberland, **$850,000.**

★**New Hampshire**—State Hy. Dpt., Concord, surface treated graveling 0.35 mi. highway and bridge, Conway, **$101,200**; 0.568 mi. hy. and bridge, Bartlett, **$56,100**; 0.568 mi. hy. and bridge, Andover, **$111,100**; road mix 7 mi. hy., at Sevanzey and Winchester, **$400,000**; 10 mi. hy. and bridge at Woodstock, Lincoln and Franconia, **$1,000,000.** Financing not yet provided for.

★**New Hampshire**—State Hy. Dpt., Concord, constructing 10 to 15 mi. hy. in Lincoln, Woodstock and Franconia, **$800,000**; 7 mi. hy., Winchester-Swanzey, **$500,000.**

N. Y., Clinton—Comrs. Dutchess Co., grading, surfacing 2 roads, **$147,100.** State Aid Planning Funds allotted.

N. Y., Fonda—Comrs., Montgomery Co., reconstructing county roads, **$235,000.** State Aid Planning Funds allotted.

N. Y., Lake George—Comrs. Warren Co., Lake George, reconstructing Beach Rd., **$40,000.** State Aid Planning Funds allotted.

N. Y., Mayfield—Village, imprv. streets, **$40,000.** State Aid Planning Funds allotted.

N. Y., Ossining—Village, street imprvs., **$154,700**; Audubon section imprvs., **$90,000**; imprv. facilities around railroad station, **$40,110.** State Aid Planning Funds allotted.

N. Y., Rensselaer—City, reconstruct Riverside Drive, **$175,000.** State Aid Planning Funds allotted.

N. Y., Rhinebeck—Comrs. Dutchess Co., grading, surfacing roads, **$107,000.** State Aid Planning Funds allotted.

N. Y., White Plains—Comrs. Westchester Co., White Plains widening, resurfacing Long Ridge Road, **$59,000**; reconstructing Co. Rd. 25, **$36,000.** State Aid Planning Funds allotted.

N. Y., Yonkers—City, reconstruct Esplanade from Lorraine to E. Lincoln Ave., **$85,000**; Lenox Ave., from Lexington to Oakland Ave., **$42,200**; S. 15 Ave., **$13,000**; Euclid Ave., from Hawthorne Terrace to Central Blvd., **$16,200**; North St. between No. 5 St. and Lincoln Drive, **$31,200**; Claremont Ave. from Claremont Place to Parkway So.,

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POSTWAR PROJECTS (Cont'd.)

$103,400; Dill Ave. from Prospect to Crest Ave., $18,600; Ellwood Ave. from Central Blvd. to Esplanade N., $31,100. State Aid Planning Funds allotted.

Tex., Houston—D. H. Canterbury, 7135 Lawndale St., plans grading, paving streets, residential development zone. Over $50,000.

★**Wash., Spokane**—W. E. Brown, comr., Spokane Co., Court House, improv. Monroe Rd., $54,000; Palouse Hwy., $52,280; Cheney-Spokane Rd., $38,520; Valley-Chapel-Mount Hope Rd., $127,980; Salnave Rd., $51,420; Coulee Hights Rd., $102,720; Elk-Chattaroy Rd., $21,200; Chatcolet Rd., $25,500; Truax Rd., $47,040.

PLANS UNDERWAY

Ga., Macon—City, concrete paving, necessary storm sewers in various streets, $300,000. W. Walker, city engr.

★**Ill., Centralia** — City, street paving $1,200,000. 5 year plan. H. B. Stover, City Hall, city engr.

Ill., Murphysboro—City, plans 75% completed street imprvs., new black topping with concrete curb and gutters, $170,000. 5 year plan. A. Stallings, Murphysboro, engr.

Ill., West Frankfort—City, plans completed, asphalt topping existing brick pavement S. Monroe St. from Main to Cleveland Sts., 12 blocks, widening from 22 ft. to 30 ft. and raising, $25,000. R. E. Vineyard, Browning Bldg., Benton, city engr.

★**Maine**—State Hy. Dpt., State Office Bldg., Augusta, preliminary survey in progress concrete super highway from Kittery to Portland, $12,000,000; engineering surveys in progress 48 mi. super highway from Portland to Fort Kent, $20,000,000. L. Barrow, ch. engr. CD 4/10—ENR 4/20.

Mass., Greenfield—Town, E. L. Bond, supt. Dpt. Streets & Engineering, Town Hall, plans 90% completed street paving, repairs, extens., $200,000. Financing not yet provided for.

★**Mich., Dearborn**—City, Municipal Bldg., plans 90% completed street paving, SAD-419, $150,000; plans 45% completed city wide paving, $966,000; plans completed street paing SAD-418, $180,000; SAD-417, $145,000; F. R. Storrer, Municipal Bldg., engr.

★**Mich., Detroit**—Dpt. Parks & Recreation, 735 Randolph St., plans completed city wide street imprvs., tree planting proj., $2,055,625. CD 3/30/43—ENR 4/1/43.

Mich., Detroit—Dpt. P. Welfare, 176 E. Jefferson Ave., plans 55% completed, concrete pavement replacing old pavement at Eastern Market, $50,000; plans 64% completed new market pavement at Western Market, $17,000. Geo. R. Thompson, City Hall, city engr.

Minn., Austin—City, J. H. Wieland, clk., City Hall, paving, curbing, resurfacing, etc. $250,000. Toltz, King & Day, 1509 Pioneer Bldg., St. Paul, consult. engrs. CD 12/8—ENR 12/16.

★**N. Y., Brooklyn** — President Brooklyn Boro, Boro Hall, plans underway repaving Arlington Pl., Halsey to Fulton Sts., (PBS-179), $6,100; Bay Ridge Ave., 14 to 15 Aves., (PBS-181), $8,300; Bristol St., Livonia to Riverdale Aves., (PBS-183), $6,900; Foster Ave., Ralph Ave. to E. 83 St., (PBS-185), $18,000; Foster Ave., E. 83 to 86 Sts., (PBS-186), $8,600; Frost St., Union to Meeker Aves., (PBS-187), $10,800; Glenwood Rd., Coney Island to Ocean Aves., (PBS-188), $30,100; Glenwood Rd., Ocean Ave. to E. 23 St., *(PBS-189), $8,900; Howard Ave., Fulton St. to Atlantic Ave., (PBS-190), $7,700; Lewis Ave., Myrtle to DeKalb Aves., (PBS-191), $17,600; Lewis Ave., Green Ave. to Chauncey St., (PBS-192), $48,000; Montauk Ave., Blake to New Lots Aves., (PBS-193), $6,900; Nevins St., Dean to Baltic Sts., (PBS-194), $10,000; Pacific St., Sackman St. to East New York Ave., (PBS-195), $7,000; Rodney St., Marcy Ave. to S. 9 St., (PBS-198), $6,900; Sedgwick St., Van Brunt to Columbia Sts., (PBS-199), $13,000; Skillman Ave., Graham Ave. to Humboldt

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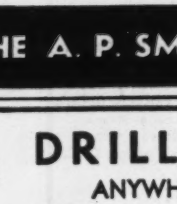

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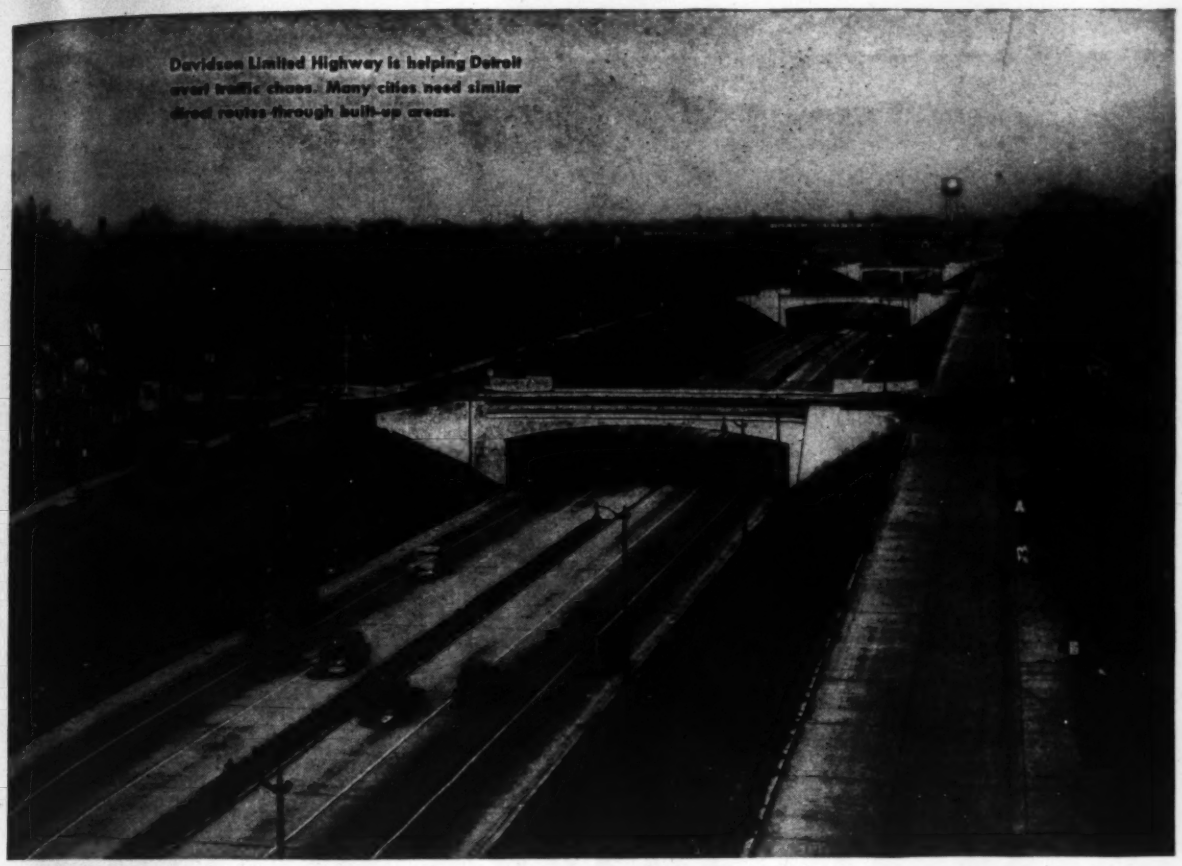
POSTWAR PROJECTS (Cont'd.)

St., (PBS-200) **$5,100**; S. 1 St., Wythe to Bedford Aves., (PBS-201), **$8,600**; Stagg St., Bushwick Ave. to Bogart St., (PBS-202), **$16,400**; Stagg St., Bogart St. to Morgan Ave., (PBS-203), **$7,400**; Vermont St., Jamaica to Atlantic Aves., (PBS-204), **$12,100**; Warwick St., Fulton St. to Atlantic Ave., (PBS-205), **$6,600**; W. 15 St. Mermaid to Surf Aves., (PBS-206), **$6,000**; Whipple St., Throop Ave. to Bway., (PBS-207), **$5,000**; 11 Ave., 80 to 82 Sts., (PBS-208), **$9,000**; 11 Ave. 82 to 86 Sts., (PBS-209), **$24,900**; 6 St., 3 to 4 Aves., (PBS-210), **$8,200**; 8 St., 8 Ave. to Prospect Park West (PBS-211), **$8,700**; 13 St., 8 Ave. to Prospect Park West (PBS-212), **$8,600**; 19 St., 4 to 6 Aves., (PBS-213), **$17,500**; 22 St., 3 to 4 Aves., (PBS-214), **$12,800**; 40 St., 5 to 7 Aves., (PBS-215), **$17,300**; 41 St., 6 to 8 Aves., (PBS-216), **$18,000**; 46 St., 5 to 6 Aves., (PBS-217), **$8,700**; 56 St., 6 to 7 Aves., (PBS-218), **$8,700**; 62 St., 5 to 6 Aves., (PBS-219), **$9,300**; Ashford St., Atlantic to Liberty Aves., (PBS-222), **$5,100**; Bainbridge St., Ralph to Saratoga Aves., (PBS-224), **$18,900**; Belmont Ave. Rockaway to Stone Aves. (PBS-225) **$14,200**; Benson Ave., Bay Parkway to 25 Ave., (PBS-226), **$34,100**; Brooklyn Ave., Dean St. to St. John's Pl., (PBS-227), **$24,100**; Carroll St., Smith to Hoyt Sts., (PBS-228), **$6,900**; Cranberry St., Columbia Hts. to Fulton St., (PBS-229), **$10,500**; Avenue F, McDonald Ave. to Ocean Parkway (PBS-230), **$23,100**; Havemeyer St., Broadway to Division Ave., (PBS-231), **$5,700**; Lincoln Ave., Atlantic to McKinley Aves., (PBS-232), **$7,100**; Locust St., Bway. to Beaver St., (PBS-233), **$5,900**; Newell St., Nassau to Driggs Ave., (PBS-235), **$7,600**; N. 9 St., East River to Kent Ave., (PBS-236), **$11,900**; N. 10 St., East River to Kent Ave., (PBS-237), **$13,400**; N. 12 St., Driggs to Union Aves., (PBS-238), **$5,000**; Otsego St., Lorraine to Beard Sts., (PBS-239), **$18,500**; Pacific St., Hicks to Court Sts., (PBS-240), **$14,800**; Palmetto Sts., Bway. to Bushwick Ave., (PBS-241), **$7,000**; Park St., Bway. to Beaver St., (PBS-242), **$6,200**; President St., 5 to 6 Aves., (PBS-243), **$8,700**; Pulaski St., Nostrand to Tompkins Aves., (PBS-244), **$21,500**; Saratoga Ave., Jefferson Ave. to Halsey St., (PBS-245), **$5,900**; Stanhope St., Knickerbocker to Cypress Aves., (PBS-247), **$28,100**; State St., Hoyt to Nevins Sts., (PBS-248), **$15,500**; Sullivan St., Richards to Dwight Sts., (PBS-249), **$6,300**; Varick Ave., Johnson to Flushing Aves., (PBS-251), **$19,100**; Walton St., Wallabout St. to Bway., (PBS-252), **$21,100**; W. 35 St., Neptune to Surf Aves., (PBS-253), **$15,600**; Willoughby Ave., Wykoff to St. Nicholas Aves., (PBS-254), **$5,400**; 11 Ave. 79 to 80 Sts., (PBS-255), **$5,200**; 20 Ave. 60 to 67 Sts., (PBS-256), **$30,000**; 20 Ave., 86 St. to Cropsey Ave., (PBS-257), **$30,100**; 2 St., 4 to 6 Aves., (PBS-258), **$17,500**; 42 St., 3 to 5 Aves., (PBS-259), **$17,200**; 43 St., 1 to 2 Aves., (PBS-260), **$11,000**; 48 St., 6 to 7 Aves., (PBS-261), **$8,700**; 60 St., 19 Ave. to Bay Parkway (PBS-262), **$37,700**; 71 St., Narrows Ave. to Ridge Blvd., (PBS-263), **$30,100**; 79 St. 12 to 13 Aves., (PBS-264), **$13,400**; 83 St., Shore to Colonial Rds., (PBS-265), **$15,200**; 87 St., Colonial Rd. to 3 Ave., (PBS-266), **$17,200**; Buffalo Ave., Bergen St. to St. John's Pl., (PBS-267), **$23,600**; Bushwick Ave., Meserole to Cook Sts., (PBS-268), **$41,000**; Kingston Ave., Fulton St. to Eastern Parkway, (PBS-269), **$44,000**; Nostrand Ave., Eastern Parkway to Empire Blvd., (PBS-270), **$30,300**; Ralph Ave., St. Marks Ave. to Lincoln Pl., (PBS-271), **$22,500**; Gates Ave., Franklin to Reid Aves., (PBS-272), **$100,000**; Washington St., Front to Prospect Sts., (PBS-273), **$8,700**. State Aid Plannings Funds allotted. P. P. Farley, Boro Hall, boro consult engr.

N. Y., Flushing—President Queens Boro, M. A. FitzGerald, comr. Boro Wks., A. K. Johnson, asst. engr. in charge of Hys., 120-55 Queens Blvd., Kew Gardens, Zone 15, plans underway reconstructing Horace Harding Blvd. from Grand Central Parkway extended to Rodman St. Bridge (PQS-29). **$180,000**. State Aid Planning Funds allotted.

N. Y., Jamaica—President Queens Boro, M. A. FitzGerald, comr. Boro Wks., A. K. Johnson, asst. engr. in charge of Hys., 120-55 Queens Blvd., Kew Gardens, Zone 15, plans underway grading, repaving 150 St., Jamaica to Liberty Aves. (PQS-36), **$50,000**; reconstructing, repaving 165 St. from Liberty to Jamaica Aves. (PQS-37), **$29,400**; 168 St. from Liberty to Jamaica Aves. (PQS-38), **$29,400**; reconstructing malls in Queens Blvd., Union Turnpike to 63 Dr. (PQS-32), **$200,000**. State Aid Planning Funds allotted.

N. Y., Jamaica—President, Queens Boro, M. A. FitzGerald, comr. Boro Wks., A. K. Johnson, asst. engr. in charge of Hys., 120-55 Queens Blvd., Kew Gardens, Zone 15, plans underway reconstructing malls, Queens Blvd. from Hillside Ave. to Union Turnpike (PQS-28), **$75,000**; repaving Liberty Ave. from 175 St. to Farmers Blvd. (PQS-30), **$73,500**; grading, paving Archer Ave. from New York Blvd. to 168 St. (PQS-33), **$10,000**. State Aid Planning Funds allotted.



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POSTWAR PROJECTS (Cont'd.)

★**N. Y., New York**—President Manhattan Boro, W. D. Binger, comr. Boro Wks., D. G. Edwards, ch. engr. Bur. Hys. & Sewers, Municipal Bldg., Zone 7, plans underway, repaving Greenwich St., Rector to Vesey Sts. (PMS-459), **$30,000**; Trinity Pl., Morris to Liberty Sts. (PMS-460), **$15,000**; Church St., Liberty to Fulton Sts. (PMS-461), **$20,000**; Church St., Fulton to Canal Sts. (PMS-462), **$50,000**; 115 St., 3 to Park Aves. (PMS-451), **$8,000**; Park Ave., 132 to 135 Sts. (PMS-455), **$20,000**; Fulton St., South to Washington Sts. (PMS-456), **$56,000**; Courtlandt St., Bway. to Church and Greenwich to West Sts. (PMS-457), **$10,000**; Liberty St., William to West Sts. (PMS-458), **$12,000**; 202 St., 9 to 10 Aves. (PMS-152), **$12,307**; 213 St., 10 Ave. to Bway. (PMS-153), **$5,490**; Houston St., East River Dr. to Ave. D (PMS-445), **$14,000**; Ave. D, Houston to 14 Sts. (PMS-446), **$50,000**; 25 St., 9 to 10 Aves. (PMS-449), **$12,000**; 168 St., Amsterdam to St. Nicholas Aves. (PMS-146), **$14,535**; 169 St., Amsterdam to St. Nicholas Aves. (PMS-147), **$12,600**; 177 St., St. Nicholas to Fort Washington Aves. (PMS-149), **$14,625**; 184 St., Amsterdam to Wadsworth Aves. (PMS-150), **$16,200**; 187 St., St. Nicholas Ave. to Bway. (PMS-151), **$15,660**; 103 St., Columbus to Amsterdam Aves. (PMS-134), **$12,195**; 109 St., Pleasant to First Aves. (PMS-138), **$9,112**; 151 St., Macombs Pl. to Bradhurst Ave. (PMS-139), **$5,850**; 160 St., Edgecomb Ave. to Bway. (PMS-141), **$20,115**; 167 St., Amsterdam Ave. to Bway. (PMS-145), **$10,035**; 131 St., 7 to 8 Aves. (PMS-119), **$12,060**; 142 St., Lenox to 7 Aves. (PMS-122), **$12,465**; 118 St., Lexington to Park Aves. (PMS-126), **$6,075**; 123 St., Lenox to 7 Aves. (PMS-127), **$11,880**; 101 St., West End to Riverside Ave., **$7,110**; 113 St., 5 to Lenox Aves. (PMS-109), **$13,410**; 116 St., Bway. to Riverside Dr. (PMS-110), **$15,367**; 119 St., Morningside Dr. to Amsterdam Ave. (PMS-111), **$7,200**; 119 St., 5 to Lenox Aves. (PMS-112), **$26,325**; 128 St., St. Nicholas to point 125 ft. west of Morningside Aves. (PMS-116), **$7,515**; 38 St. 10 to 11 Aves. (PMS-100), **$12,195**; 41 St., 11 to 12 Aves. (PMS-101), **$12,150**; 46 St. East River Dr. to First Ave. (PMS-102), **$6,030**; 64 St., 3 to Lexington Aves. (PMS-103), **$5,940**; 82 St., Park to 2 Aves. (PMS-108), **$22,635**. State Aid Planning Funds allotted.

★**N. Y., New York**—President Manhattan Boro, W. D. Binger, comr. Boro Wks., D. G. Edwards, ch. engr. Bur. Hys. & Sewers, Municipal Bldg., Zone 7, plans underway repaving Bowery, Chatham Sq. to 3 Ave. (PMS-24), **$117,000**; 3 Ave., 8 to 41 Sts. (PMS-71), **$200,000**; 3 Ave., 41 to 74 Sts. (PMS-72), **$200,000**; 3 Ave., 74 to 107 Sts. (PMS-73), **$200,000**; 3 Ave., 107 to 116 Sts., and 125 to 130 Sts. (PMS-74), **$72,052**; South St. and Marginal, Whitehall St. to Rutgers Slip (PMS-49), **$100,000**; 2 St. Bway. to Ave. D (PMS-70), **$13,163**; Wadsworth Ave., 173 to 177 Sts. (PMS-81), **$5,887**; 36 St., Lexington to Park Aves. (PMS-84), **$6,525**; 16 St., 9 Ave. to Marginal St. (PMS-87), **$16,740**; 17 St., 10 to 11 Aves. (PMS-88), **$5,625**; 18 St., 10 to 11 Aves. (PMS-89), **$7,110**; 19 St., 10 Ave. to Marginal St. (PMS-91), **$8,505**; 23 St., 3 to 12 Aves. (PMS-93), **$107,190**; Greenwich St., Vesey to Canal Sts. (PMS-34), **$96,795**; Hudson St., West Bway. to 14 St. (PMS-39), **$103,275**; Wooster St., Canal to W. 4 Sts. (PMS-66), **$6,600**; 5 Ave., Washington Square North to 60 St. (PMS-77), **$116,375**; Third St., Lewis St. to 2 Ave. (PMS-75), **$13,225**; Bradhurst Ave., 141 to 151 Sts. (PMS-25), **$15,550**; Charlton St., Greenwich to Washington Sts. (PMS-26), **$5,895**; Cherry St., Roosevelt to Jackson Sts. (PMS-27), **$18,963**; East River Dr., 23 to 43 Sts. (PMS-30), **$108,000**; East River Dr., 64 to 81 Sts. (PMS-31), **$76,500**; East River Dr., 90 to 93 Sts. (PMS-32), **$61,740**; Hamilton Pl., Bway. to 140 St. (PMS-35), **$14,962**; Jumel Terrace, 160 to 162 Sts. (PMS-40), **$5,850**; MacDougal St., Prince to Bleecker Sts. and Minetta Lane

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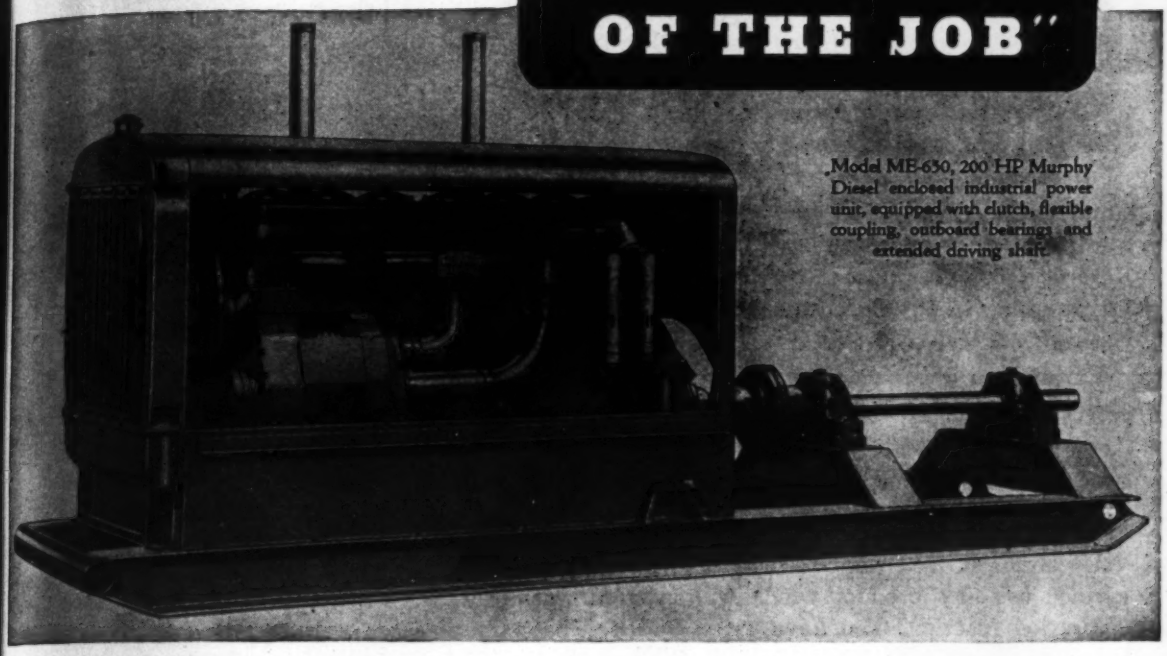

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to Washington St. (PMS-43), $[illegible]; Mercer St., W. 3 to 8 Sts. (PMS-44), $14,580; Mulberry St., Canal to Houston Sts. (PMS-45), $5,790; Norfolk St., Hester to Delancey Sts. (PMS-46), $5,355; Spring St., Hudson to West Sts. (PMS-50), $13,815; Thompson St., Canal to W. 4 Sts. (PMS-52), $15,000; Tieman Pl., Bway. to Riverside Dr. (PMS-53), $14,895; Wall St., South to Water Sts. (PMS-54), $15,390; 93 St., Central Park West to Amsterdam Ave. (PMS-58), $6,462; 105 St., Bway. to Riverside Dr. (PMS-61), $10,215; 113 St., Lenox to St. Nicholas Aves. (PMS-62), $5,535; 116 St., East River Dr. to Park Ave. (PMS-64), $21,262; 2 Ave., 3 to 23 Sts. (PMS-67), $135,000; 2 Ave., 60 to 97 Sts. (PMS-68), $193,500; 2 Ave., 97 to 127 Sts. (PMS-69), $121,500; widening 5 Ave., 124 to 142 Sts. (PMS-76), $150,000; West Bway., Vesey St. to Washington Sq. South (PMS-65), $190,800; 79 St., East River Dr. to 5 Ave. (PMS-106), $124,200; 72 St., East River Dr. to 5 Ave. (PMS-104), $127,170. State Aid Planning Funds allotted.

N. Y., New York—President Manhattan Boro, W. D. Binger, comr. Boro Wks., D. G. Edwards, ch. engr. Bur. Hys. & Sewers, Municipal Bldg., Zone 7, plans underway safety island at 3 locations (PMS-23) $200,000; at 31 locations, (PMS-22). $200,000. State Aid Planning Funds allotted.

N. Y., New York—President Manhattan Boro, W. D. Binger, comr. Boro Wks., D. G. Edwards, ch. engr. Bur. Hys. & Sewers, Municipal Bldg., Zone 7, plans underway paving, drainage alterations at Jacob Riis Houses, E. 6 to 11 Sts., and East River Drive to Ave. D (PMS-463), $137,000. State Aid Planning Funds Allotted.

N. Y., St. Albans—President Queens Boro, M. A. FitzGerald, comr. Boro Wks., A. K. Johnson, asst. engr. in charge of Hys., 120-55 Queens Blvd., Kew Gardens, Zone 15, plans underway repaving Linden Blvd. from Merrick to Springfield Blvds., (PQS-31), $88,200. State Aid Planning Funds allotted.

N. Y., Springfield Gardens — President Queens Boro, M. A. FitzGerald, comr. Boro Wks., A. K. Johnson, asst. engr. in charge of Hys., 120-55 Queens Blvd., Kew Gardens, Zone 15, plans underway reconstructing Merrick Blvd. from Farmers Blvd. to Nassau Co. Line (PQS-3[illegible]. $195,000. State Aid Planning Funds allotted.

N. Y., Woodside—President Queens Boro, M. A. FitzGerald, comr. Boro Wks., A. K. Johnson, asst. engr. in charge of Hys., 120-55 Queens Blvd., Kew Gardens, Zone 15, plans underway reconstructing malls in Queens Blvd. from 57 St. to Roosevelt Ave., (PQS-34), $200,000. State Aid Planning Funds allotted.

O., Barberton—City, R. K. Dobbs, mayor, City Hall, plans 5% completed paving various streets, $432,000. Financing not yet provided for. H. Bushey, City Hall, city engr. CD 12/10—ENR 1/13.

★**O., Canton** — Comrs. Stark Co., Hilda Schrants, clk., Court House, plans completed paving, resurfacing, imprv. various roads, $600,000. L. K. Zerbe, Court House, engr.

★**O., Mansfield**—Comrs. Richland Co., L. Henry, clk., Court House, plans 10% completed, repairing, constructing hys., roads, streets, $1,230,000. H. C. Sword, Court House, co. engr. CD 3/20—ENR 4/6.

★**Pennsylvania**—State Hy. Dpt., c/o J. U. Shroyer, secy., Harrisburg, 4-lane hy. with divisor, full 120 right-of-way to be obtained grade separations with Pennsylvania and Reading railroads, approx. 6.4 mi. extending from Trindle road north to St. John's Cemetery, east, north of Pennsylvania railroad tracks, continuing to Louther St., Lemoyne to Iron Alley in south Harrisburg and to U. S. Route 422 and 33 St. in Paxtang, Cumberland and Dauphin Counties, $1,902,000 West Shore Highway Construction and $1,603,000 east shore highway construction; 5.34 mi. 4-lane hy. from point on U. S. Route 22 at Fort Hunter, edging Wildwood Lake in Harrisburg and ex-

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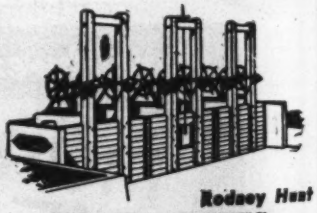

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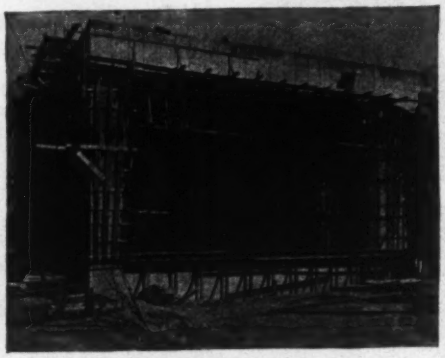

Note the economy with which Safway Scaffolding was employed in the construction of this large war plant at Butler, Wisconsin. Not only did the contractor use it to shore heavy concrete beams at a height of 45', over an extremely large area, in record time, (as shown in the illustration above), but upon completion of this phase, quickly dismantled and reassembled the equipment to provide brickmasons with sturdy working bases. Standard Safway Equipment is being used with the same economy by many contractors for all types of shoring as well as general purpose scaffolding applications because its design and tubular steel all welded construction enables it to be speedily erected, by a few men, into structures that will safely withstand any load or work requirement.

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POSTWAR PROJECTS (Cont'd.)

tending to U. S. Route 22 in P constructing overhead crossing of P vania Railroad along with interch Route 39 providing easy access to W Park, **$877,000;** 2.22 mi. 4-lane hy. ing from U. S. 22 in Penbrook where Route 543 intersects, southerly to a an interchange with U. S. Route 42 St. in Paxtang, incl. construction of leaf turn at Route 22, with raising 22 to pass over proposed new highw minor alterations in existing street **$1,668,000;** 12.25 mi. 4-lane highwa divisor from 33 St. in Paxtang er southerly paralleling U. S. Route 23 risburg-Lancaster Road) to point o Route 230 near Dauphin-Lancaster C 120 ft. right-of-way and area to be graded, paved, **$3,237,000,** Dauphi 10.5 mi. 2 lane one-way east bound way from Middlesex at Pennsylvania pike following new location east o parallel to but south of U. S. Route point near Trindle road north to St. Cemetery, 120 ft. right-of-way, C land Co., **$1,830,000.** Land rights not and financing not yet provided for. Buckius, ch. engr.

★**Pennsylvania**—State Hy. Dpt., burg, relocation of 4.64 mi. Ro necessary to eliminate alignment by- Darlington Borough, **$396,000;** imprv. 51 1.66 mi. from west end of Bridg Rochester Bridge north to Pennsylva Lake Erie Railroad underpass, **$285,** prvs. 3.98 mi. Route 67 incl. widening gradient from west end of Beacher B line to west end of Borough Twp. li from west end of Midland Borough lin Co.-Ohio State line and to raise sections above flood level, **$343,000;** 30 imprv. in accordance with similar ment on third highway outside of approx. 11.93 mi. incl. 4 lane divided way from south co. line to west c **$287,000;** relocation of Route 11 2.98 mi. eliminating poor alignme grade, from west Monaca Borough ½ mi. west of Potter Twp., **$287,000;** ing, pavement imprv. 0.67 mi. Ro through Monaca Borough to Monaca-Rochester Bridge, **$93,000;** 8.95 mi. Route 930 with existing incl. stabilizing back slopes, addnl. as in Aliquippa and realignment Monaca Borough, **$737,000;** imprv. 9.61 mi. Route 88, highway adjunct River Blvd. exten. in New Brighton north to Co. line at Ellwood City B **$550,000;** approx. 4.64 mi. relocation 51, **$300,000,** land rights not cleared; 3.97 mi. relocation on Route 68, land rights not cleared; interchanges and west ends of Fallston Bridge Brighton Borough and Fallston b **$324,000;** general imprvs., of Sta County maintained road sys., general rural road imprvs., location 3.97 mi. Route 68 involving in grade and alignment removing dition problems on road located in Twp., **$278,000;** 1 mi. Route 68 imprv ient and pavement width, Dougher **$61,000;** relocation 2.32 mi. Highway end Beaver Co., connecting 18 and access to north co. industries and highways to Ohio, **$200,000;** imprv. 1 width, alignment, pavement from G Borough north to county line, **$874,** cation 4.64 mi. Route 168, necessary proach to proposed Georgetown G Bridge, **$451,000.** M. Baker, Jr., Ro consult. engr. CD 8/3.

Pa., Beaver—Beaver Co., Beaver, 420 mi. county's major highway sys. 500; repairs, maintenance and rec tion 557.86 mi. rural roads, **$10,500,** nancing not yet provided for; repairs, tenance, reconstruction D7.18 mi. rur imprvs., **$3,220,000.** M. J. Baker, Jr., ester, consult. engr.

★**S. C., Charleston**—City, plans 25 pleted street imprv., exten., **$1,** plans completed street connections, B. M. Thomson, City Hall, city eng 2/4/43—ENR 2/11/43.

★**Tex., San Antonio**—City, G. B. mann, mayor, City Hall, plans u inter-regional hy. incl. 6-lane roads, **000.** Michael Baker, Jr. & Associates, Bldg., consult. engrs.

Vt., Burlington — City, sidewalk **$200,000.** Financing not yet provid Geo. C. Stanley, city engr.

★**Washington**—State Hy. Dpt., C rebuilding 10 to 12 mi. 4-lane hy. Seattle and Tacoma, **$2,000,000.** B. state hy. dir.

Wis., Shorewood—Village, E. G. T mgr., 3930 W. Murray Ave., Z 12 imprvs. **$283,885.** G. D. Sims, village

★**Wis., West Allis**—City, 7525 W. field Ave., Z. 14, street imprvs. P. Burbach, city engr.

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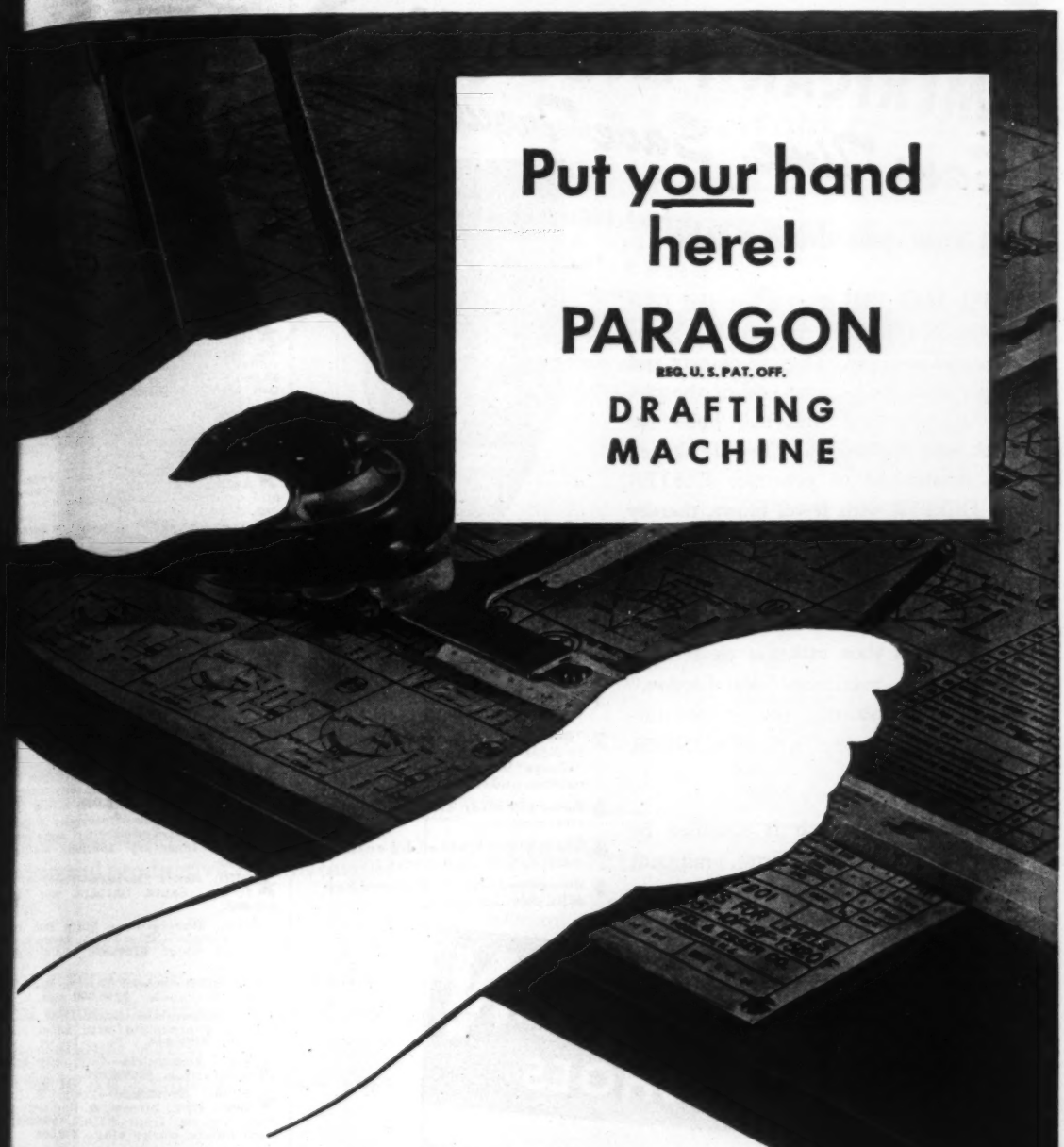
PROPOSED WORK

★**Ill., Cairo**—City, filling low are outside city limits over 5 or 6 year raising land along river to height 2 mi. long and ½ mi. wide, makin acres available for residential and in dists. **$6,329,762.**



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POSTWAR PROJECTS (Cont'd.)

Mass., Medford — City, W. Law mayor, City Hall, plans straightening River, Wellington Bridge to Craddock Over $25,000.

N. Y. Ossining—Village, rebuildin taining wall, Main St. $32,000. Sta Planning Funds allotted.

PLANS UNDERWAY

La., Breaux Bridge—Acadia-Vermili rigation, Crowley, plans 80 % com enlarging 8 mi. canal, installing structure. $60,000. Pan American neers, 912 5 St., Alexandria, consult. en

Mich., Detroit—Dpt. P. Wks., City plans completed dredging outlet of C Creek providing increased capacity for water flow, $140,000; retaining dike on nors Creek bank, $10,000. Geo. R. Thom City Hall, city engr.

Mich., River Rouge—City, plans und seawall along River Park, foot of C Highway. $175,000. Mason L. Bro Son, 120 Madison St., Detroit, consult.

★**Texas**—Brazos River Conservation lamation Dist., Geo. C. Chance, pres eral Wells, plans underway construction control dam on Leon River, at Temple $2,000,000; plans 5% completed flood trol and power dam at De Cordova at 15 mi. west of Cleburne, $3,500, more; flood control dam on Lampasas at Belton, over $1,500,000. Amburse Corp., 295 Madison Ave., New York, consult. engrs.

★**Tex., Rockland**—Lower Neches Auth., Beaumont, plans underway and concrete dam on Neches River (co ing flood waters for use when river low tide), $3,500,000; canals on Neches area providing water dist. from Ro Dam, $6,500,000. J. B. Converse Port Arthur, consult. engrs.

Tex., Waco—City, bond election soo bankments, levees, etc., for flood inside city limits. $100,000. W. F. City Hall, engr.

Ont., Leamington—Dominion Gover Ottawa, 2,000 ft. seawall, breakwater, 000. Dpt. P. Wks., Ottawa, engr.

PUBLIC BUILDINGS

PROPOSED WORK

★**Ala., Birmingham** — Jefferson C Health, 231 N. 19 St., city-county department bldg. $598,000.

Calif., Riverside—University of Cal Riverside, library bldg., with audi $300,000; insectary $60,000; heating $60,000.

★**Calif., Santa Barbara**—University o fornia, Santa Barbara, new bldg 500,000.

Conn., Hartford — State Dpt. Am Legion, State Office Bldg., brick, steel quarters bldg. $150,000. Land righ cleared.

Ill., Cairo—School Dist. 1, Cairo Jr School, 2 schools. $150,000 each.

Ill., Carbondale—School Dist. 95, H School, gymnasium with addnl. roo classes. $150,000.

★**La., Alexandria**—City, city hall auditorium, $1,300,000.

★**Mass., Greenfield**—Town, E. L. supt. Dpt. Streets & Engineering. Hall, Junior High School, $600,000; steel public works bldg., $70,000.

Mass., Leominster—City, Mayor La City Hall, 3 story, bsmnt., brick, ston hall annex, concrete fdn., $200,000; School addn., $12,000.

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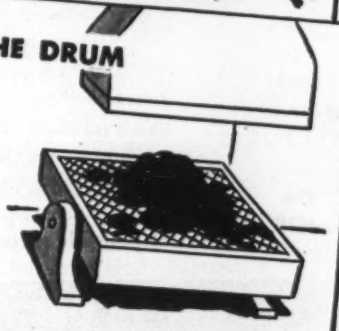

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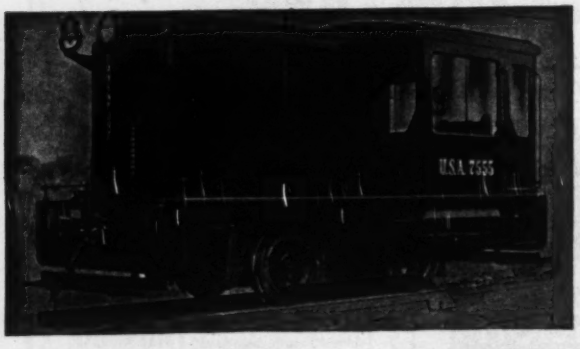

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POSTWAR PROJECTS (Cont'd.)

†**Minn., Minneapolis** — Federal Agency, Court House, St. Paul, fe courts and branch post office bldg., $150,000.

★**Mo., Richmond Heights** (br. St. Lo City, F. Noel, city engr., City Hall, Big Bend Rd., Richmond Heights, St. L Zone 5, library and school bldgs., paving, parks and playgrounds, $951,5

N. Y., Buffalo—Dpt. P. Wks., State Bldg., Albany, reception bldg. addn., al tion, at Buffalo State Hospital, for Mental Hygiene. $296,000.

N. Y., New York—New York City Hou Auth., 122 E. 42 St., Zone 17, 8 story, bldg. on 100x100 ft. plot, 405-411 E. 4 Over $150,000 Land acquired.

★**N. Y., Oneonta**—Dpt. P. Wks., State Bldg., Albany, administration bldg., $ 000; auditorium, $222,000; physical educ bldg., $342,000; Home Economics bldg., 000; heating plant, service connections, $261,000, State Teachers College, for Educ., Education Bldg., Albany.

N. Y., Plattsburg—Dpt. P. Wks., Office Bldg., Albany, Home Economics b at State Teachers College, for Dpt. E Education Bldg., Albany. $253,330.

N. Y., Potsdam—Dpt. P. Wks., State Bldg., Albany, physical education b $351,000; heating plant and service con tions, $166,000, State Teachers College, Dpt. Educ., Education Bldg., Albany.

O., Salem—City, F. K. Wilson, dir. Service, plans bond election, city hall 000.

†**R. I., Middletown**—Pub. Bldgs. Adm 18 and F Sts. N.W., Wash. 25, D. C., b stone post office, $100,000

R. I., Westerly—Town, B. Ward, sup Schools, plans 2 story, bsmnt., brick, school, Wells St. Sect. $200,000.

★**Tex., Austin**—University of Texas, Au Pan-American bldg., $500,000; geo bldg. addn., $250,000; physics bldg. a $200,000; foreign language bldg., $400, engineering research bldg., $500,000; lab tory bldg. for foods, etc., $50,000; m bldg. addn., $350,000; elementary pra teaching bldg., $250,000; chemistry b addnl. unit, $500,000; anthropology b $200,000; publicity-press bldg., $400, drama bldg., $375,000; biology labora bldg., $250,000; geology and business rese bldg., $300,000; educational and psycho bldg., $800,000; pharmacy and science b $800,000; social science bldg., $375,00 school, $750,000; engineering unit, $750, art and museum, $425,000; water labora for naval architecture civil and marine e neering, $200,000; engineering expan bldg., facilities (Unit 2), $750,000; engin ing expansion bldg. (Unit 3) and conver laboratory, $500,000; power plant addn. (2), $750,000; addnl. power plant and fa ties; $200,000; storage and service b $410,000; library addn., (No. 2), $700, library expan., air-conditioning, etc., $ 000; administration hall, $700,000; air- ditioned auditorium $1,200,000; faculty b $200,000; planning and consultation b $375,000; health center, $500,000; wom field house, $150,000; men's dormitory dining hall, $600,000; constructing group smaller bldgs., on campus, $175,000; remo ing, expansion, reconditioning, etc., exist campus bldgs., $150,000; grounds developm landscaping, paving, $100,000; 2 men's dor tories, $500,000; women's dormitories, $ 000; married graduate students' dormit $300,000; Hill Hall athletes dormitory b addn., $200,000; 2 wings for Texas Memo Museum, $500,000; health center, $500,000.

PLANS UNDERWAY

★**Ala., Birmingham**—City Bd. Educ., C Hall, L. Fazer Banks, supt., plans co pleting Ransey High School, shops, $1, 416; design stage new bldg. for 17 A School, $102,788; school for Cameron-L School, $718,532; 10 classrooms, shops at P Hayne School, $763,580; addnl. units to B School, $154,923, Curry School $111,731, Acipco School $101,874, Gibson School $3 Barrett School $184,030, Baker School 668, Fairview School $228,820, Elyton Sch $43,919, Graymont School $92,484, Ger School $68,072, Glen Iris School $233, Jackson School $53,049, Holman School 668, Hemphill School $79,860, Martin Sch $39,267, Lee School $68,072, Kennedy Sch $69,480, Robinson School $175,100, Y Birmingham School $56,336, Moore Sch $99,015, Minor School $238,491, Wylam Sch $27,698, Wilson School $103,282, 30th School $568,633, Ullman School $79 Parker High School $412,772, Hudson Sch $179,293, East Thomas School $65,718, C cil School $180,274, Avondale School $13 Lewis School $299,023, Lincoln School $ 132, Thomas School $58,213, Washing School $309,894, new school in Belv Heights area, $205,364; completing West E High School incl. auditorium, 2 gymnasiu etc., $955,338; 2 story Parker High Sch addnl. unit, $384,730; preliminary st addnl. units to Powell School $242,333, Ga City School $202,638, Inglenook School $ 263, Lakeview School $207,670, Woodla School $303,713, Zion Heights School $ 426, Thomas Furnace School $30,294, Pri

POSTWAR HIGHWAY PLANNING?

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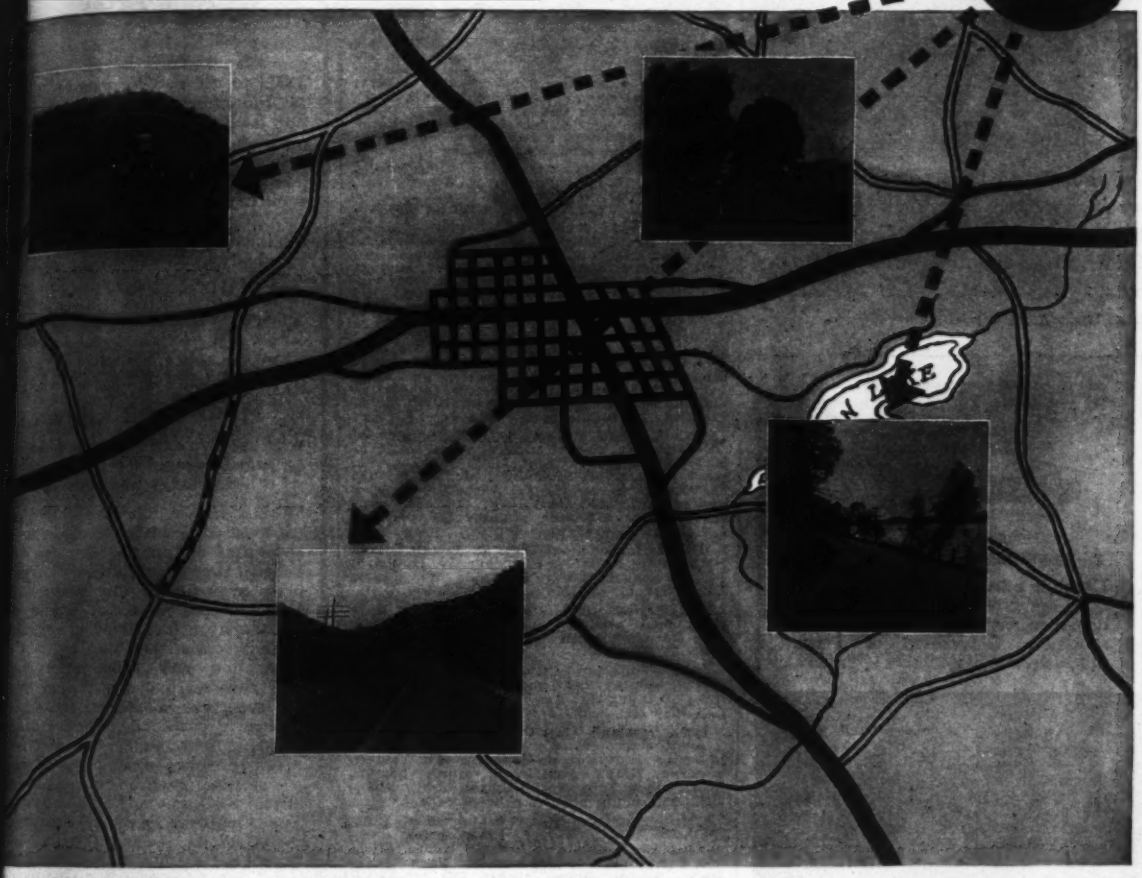

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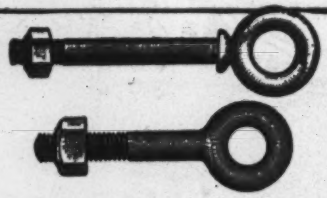

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ton School $212,158, South Pratt School $270,500, Tuggle School $495,928, Vinesville School $33,750, Kingston School $291,000, Patterson School $515,670, Pratt City School $9,990, Graymont School $539,775, Eureka School $59,555, East Lake School $42,466, East Birmingham School $363,387; central administration bldg., $230,500.

★**Calif., Berkeley**—University of California, Berkeley, plans by A. Brown, Jr., superv. archt., 251 Kearny St., San Francisco, Hesse Hall addn., engineering, $160,000; library, $1,250,000; engineering bldg., $1,000,000; School of Public Health, $1,500,000; chemistry laboratory, $600,000; jurisprudence bldg., $675,000; forestry bldg., $600,000; forest products laboratory, $500,000; anthropology $500,000; home economics $500,000; insectary, $50,000 utilities expan. $100,000.

★**Calif., Davis**—University of California, Davis, plans by Blanchard & Maher, 369 Pine St., San Francisco, veterinary science $1,000,000; plans by R. J. Evans, superv. archt., plant sciences, $500,000; soils and irrigation, $300,000; poultry husbandry, $250,000; student health center, $150,000; home economics, $500,000; Putah Creek bridge, $6,000; utilities expan., $50,000.

†**Calif., La Jolla**—University of California, La Jolla, library, museum and aquarium, $125,000; pier repairs and rehabilitation, $50,000; sea wall, $25,000; utilities, $25,000.

★**Calif., Los Angeles**—University of California, 405 Hilgard St. W. Los Angeles, plans by D. Allison, superv. archt., 420 Edison Bldg., student health center $450,000; student hospital $600,000; library $750,000; engineering $1,250,000; social sciences $750,000; life sciences $1,000,000; College of Business Administration & Economics $750,000; geological sciences and petroleum engineering $850,000; men's gymnasium addn. $300,000; women's gymnasium addn., $300,000; home economics $500,000; administration bldg. addn., $250,000; outdoor theatre completion and seats, $235,000; education or art bldg., $500,000; utilities expan. $100,000.

★†**Calif., San Francisco** — University of California, San Francisco, plans by T. L. Pflueger, superv. archt., 580 Market St., teaching hospital $4,000,000; medical science $1,000,000; nurses home $500,000; internes quarters, $200,000 dental clinic $100,000; generator plant $125,000; laundry $80,000. CD 5/7/43—ENR 5/15/43.

Ill., Marion—School Dist. 52, Logan School Bldg., plans by P. John Hoener, W. Hubbard, 3415 S. Kingshighway, St. Louis, Mo., Junior High School, E. Main St. $300,000.

Ill., Marion—School Dist. 200, E. W. Morrison, pres., sketch plans by P. John Hoener, 3415 S. Kingshighway, St. Louis, Mo., high school. $300,000.

Ind., Anderson—City, plans 10% completed, enlarge light and power plant taking care of industries and homes, $250,000. V. Lee, city engr. CD 2/4/43—ENR 2/11/43.

Ind., Portland—Jay Co. Hospital, Anna L. Yeager, supt., 505 W. Arch St., preliminary plans by Hamilton & Graham, 411 Western Reserve Bldg., Muncie, 2 story, bsmnt., brick, stone, rein.-con. hospital addn. $150,000. Financing not yet provided for.

★**Me., Augusta**—State, State Office Bldg. Auth., State House, plans brick, steel state office bldg., rear of State House. $800,000. Perry, Shaw & Hepburn, 955 Park Square Bldg., Boston, Mass., archts. CD 3/3—ENR 3/23.

★**Mass., Boston**—City, Trustees George Robert White Fund, 45 City Hall, plans completed by Maginnis & Walsh, 1222 Statler Bldg., granite, marble war memorial bldg. $1,000,000.

Mass., Chelsea—Commonwealth of Massachusetts, State Military Dpt., State House, Boston, plans completed brick, steel boiler plant, Soldier's Home. $195,000. Office of Hollis French, 210 South St., Boston, consult. engr. CD 1/7—ENR 1/27.

Mass., Sharon—Town, H. R. Andrews, chn. Bd., Town Hall, plans by H. J. Korslund, 153 Nahatan St., Norwood, brick, steel, garage for Dpt. P. Wks. $45,000.

★**Mich., Detroit**—Bd. Educ., 1345 Bway. Ave., plans 75% completed by J. Ivan Dise, 2631 Woodward Ave., brick, steel, rein.-con., stone 1st addn. to law school, $188,539; plans 50% completed by above architect brick, steel, concrete, stone, Mason School addn., $190,000; plans by Giffels & Vallet, 1000 Marquette Bldg., brick, steel, rein.-con. stone 1st unit Everett Elementary and Intermediate School, $1,600,000; plans by Harley & Ellington, 1507 Stroh Bldg., brick, steel, stone, concrete 1st unit elementary and intermediate school, $425,000; plans by Herman & Simons, 804 Transportation Bldg., brick, steel, stone, concrete Barton School, $196,845; plans by above architect brick, steel, concrete shop unit for Post Secondary School, $88,788; plans 10% completed by Lane, Davenport & Meyer, 806 Farwell Bldg., Pershing Secondary School addn., $1,077,035, plans by McGrath & Dohmen, 2631 Woodward Ave., Health Unit for Post Secondary School, $211,956, Mumford Secondary School bldg., $3,122,705, all foregoing brick, steel, stone, rein.-con.; plans by Malcolmson,

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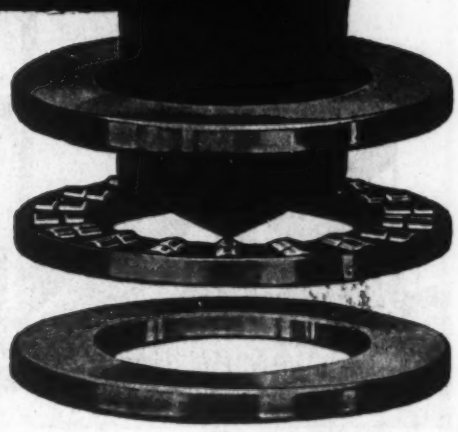

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Calder & Hammond, 1211 Griswold St., unit brick, steel, concrete, stone, Carl... School, $178,554; brick, steel, rein.-con. st... unit for Mackenzie Secondary School, ... 787; plans completed by Warren Pilafian, ... Madison Ave., student [illegible] for Wayne U... versity, $1,000,000; plans by above archit... classroom bldg., Wayne University, $648,... plans by E. Schilling, 40 Griswold St., ... addn. to Wayne School, $126,205, all fo... going brick, steel, stone, rein.-con.; plans completed by G. L. W. Schultz, 1244 Bu... vocational school, Aero Mechanics bld... brick, steel, rein.-con., $66,000; plans ... above architect 4 story, brick, rein.-c... warehouse with 1 story, 138x182 ft. gara... $409,000; plans by Shreve, Anderson & Wa... er, 914 Marquette Bldg., 3rd addn. to Ve... School, $150,006; plans by N. C. Soren... 2300 Industrial Bank Bldg., 1st addn. ... Higginbotham School, $199,930, both bri... steel, stone, concrete; Redford Second... school library and offices, brick, steel, sto... rein.-con., $204,163; brick, steel, stone, c... crete Health unit for Redford Second... School, $415,668, 2nd addn. to Arthur Scho... $146,850; plans by Chas. Sullivan, 2... Woodward Ave., 1st addn. Parkman Sch... bldg., $166,925, both brick, steel, sto... rein.-con.; plans by B. C. Wetzel & Co., 4... Pacific Ave., 1st unit Trix School, brick, st... concrete, stone, $178,356. CD 3/11, 3/... ENR 3/18, 4/1.

★**Mich., Detroit**—City Plan Comn., ... Randolph St., preliminary plans und... way by B. Pickens, 2306 Waverly Av... Planetarium and Museum of Astronom... $1,000,000; brick, stone, steel, rein.-con. M... seum of Natural History bldg., $1,500,... Hall of Human Progress bldg., $800,... Detroit Historical Museum bldg., $2,000,... All units for museum group to be coordi... ated with Wayne University area.

Mich., Detroit—Bd. Fire Comrs., ... Larned St., plans 10% completed 50x102 ... brick, steel, concrete, stone telegraph st... station for Fire Dpt., $150,000; plans co... pleted brick, steel, rein.-con. fire station ... Jas. Couzens and Meyers Rds., $75,000; 4-c... garage, $2,500. Geo. R. Thompson, c... engr.

Mich., Detroit—Dpt. Health, 3919 John ... St., plans 10% completed brick, steel, ston... concrete service bldg., and relocation ... institutional clinics, $266,135.

Mich., Detroit—Detroit Election Comm... City Hall, plans completed 1 story, 40x210 f... brick, rein.-con. shop and warehouse. $4... 000. Geo. R. Thompson, City Hall, city en...

★**Mich., Detroit**—Detroit Pub. Lighti... Comn., E. Atwater St., preliminar... study completed 35,000 kw. brick, ste... rein.-con. power plant (steam driven ele... tric) in Waterworks Park, $5,200,000. Smit... Hinchman & Grylls, 800 Marquette Bld... Detroit, and Burns & Row, Inc., 233 Bwa... New York, N. Y., consult. engrs.

Mich., Detroit—Dpt. P. Welfare, 176 ... Jefferson Ave., plans underway impro... addns. to Receiving Hospital, $193,550. Ge... R. Thompson, City Hall, City engr.

Mich., Detroit—Library Comn., Libra... Bldg., Woodward Ave., plans 11% complet... 1 story bsmt., concrete, steel, brick, s... stone library bldg., for Gratiot and Gren... Branch Library, $150,000. Geo. R. Thom... son, City Hall, city engr.

Mich., Detroit—Pub. Lighting Comn., ... Atwater St., plans 17% completed brick ... steel, concrete addn. to Porter St. substati... $200,000; plans 9% completed brick, ste... rein.-con. Mullet St. substation, $300,0... Geo. R. Thompson, City Hall, city engr.

Mich., Holland—Holland City Hospit... preliminary plans by L. C. Kingscott ... Associates, Inc., 208 Elm St., Kalamaz... brick, steel, concrete hospital addn., $200,0...

★**Mich., Kalamazoo**—Michigan State Hosp... tal, plans by L. C. Kingscott & Asso... ates, Inc., 208 Elm St., 2 brick, steel, ston... concrete hospital service department bldg... $400,000, and Patients' and Occupation... Therapy bldg., $250,000.

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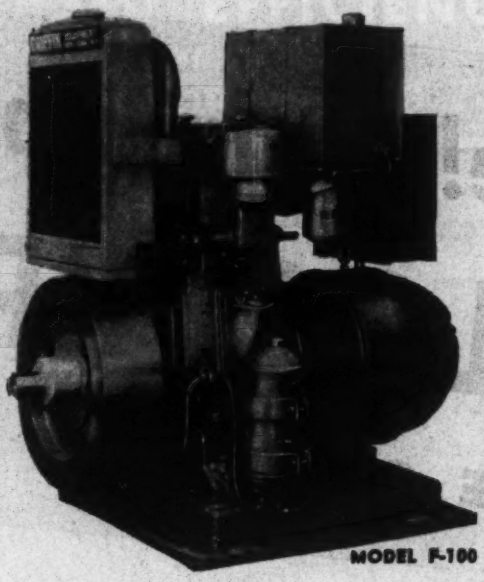

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POSTWAR PROJECTS (Cont'd.)

★**Mich., Lapeer**—State Administrative Bd., Lansing, plans by Francis Engineering Co., engr. and archt., 204 [illegible] Bldg., Saginaw, 2 story, bsmnt., brick, steel, rein.-con. school, $300,000; brick, steel, stone, concrete bldg. for staff living quarters, $200,000; brick, steel, stone, concrete receiving hospital, $350,000; maintenance and service projects, $91,000; utility services lines, electric, telephone, steam lines, $80,000, all at State Home & Training School.

Mich., St. Joseph—St. Joseph Sanitarium & Hospital, St. Joseph, preliminary plans underway by Perry W. Swern & Assoc., 19 S. La Salle St., Chicago, Ill., brick, steel, concrete hospital bldg., $350,000. CD 1/13—ENR 1/27.

Mich., Wayne—Wayne General Hospital, 3835 Biddle Ave., plans by Bennett & Straight, 13530 Michigan Ave., Dearborn, 190 bed, brick, steel, rein.-con. hospital addn., $143,000.

Minn., Red Wing—Bd. Educ., I. S. Harbo, supt., plans by Toltz, King & Day, 1509 Pioneer Bldg., St. Paul, high school addn., incl. gymnasium, auditorium. Over $200,000. CD 8/22—ENR 8/24.

★**N. J., Laurel Hill,** (Jersey City)—Hudson Co., Court House, Jersey City, plans by J. T. Rowland, 30 Journal Sq., 10 story, brick county general hospital and exten. to present hospital bldg., at Laurel Hill, $5,000,000.

N. Y., Albany—Dpt. P. Wks., State Office Bldg., Zone 1, plans underway by Gander, Gander & Gander, 17 Steuben St., ED-1 gymnasium at State College for Teachers, for Dpt. Educ., Education Bldg., $438,900.

N. Y., Albany—Dpt. P. Wks., State Office Bldg., Zone 1, plans underway by H. O. Fullerton, 152 Washington Ave., ED-2 commercial studios bldg., $157,500; ED-3 library addn., $231,840, at State College for Teachers for Dpt. Educ., Education Bldg. CD 6/21—ENR 6/29.

N. Y., Buffalo—Dpt. P. Wks., State Office Bldg., Albany, Zone 1, preliminary plans complete H-28, addnl. boiler and equip., Institute for Study of Malignant Diseases, for Education Dpt., Education Bldg., Albany, $50,000. Div. Constr., Div. of Architecture, C. J. White, comr. architecture, State Office Bldg., Albany, engr.

★**N. Y., Cortland**—Dpt. P. Wks., State Office Bldg., Albany, Zone 1, plans underway by C. W. Clark, Cortland, ED-5 physical education and health bldg., $501,846; plans underway ED-5 heating plant, $185,000 at Cortland State Teachers College, for Education Dpt., Education Bldg., Albany. Div. Constr., Div. Architecture, C. J. White, comr., Architecture, State Office Bldg., Albany, engr. CD 6/21—ENR 6/29.

N. Y., Hudson—Dpt. P. Wks., State Office Bldg., Albany, Zone 1, preliminary plans underway SW-3, laundry., Div. Construction, Div. Architecture, C. J. White, comr. Architecture, State Office Bldg., Albany, Zone 1, engr., $75,000; SW-1, Heating and electrical service $219,000, both at New York State Training School for Girls, for Dpt. Social Welfare, State Office Bldg., Albany, Zone 1.

★**N. Y., New York**—Bd. Educ., 49 Flatbush Ave. Exten., Brooklyn, Zone 1, plans completed by E. Kebbon, c/o Owner, 3 story, bsmnt., school No. 33, 9 Ave. and 26 St., $676,000.

N. Y., New York—President, Manhattan Boro, W. D. Binger, comr. Boro Wks., Municipal bldg., Zone 7, plans underway, new concrete mixing plant (PMS-156), $50,000; access ramp to garage and miscellaneous equipment, (PMS-159), $100,000, both at Municipal Asphalt Plant at 91 St. and East River Drive. CD 1/31—ENR 2/10.

★**N. Y., New York**—President Manhattan Boro, W. D. Binger, comr. Boro Wks., Municipal Bldg., Zone 7, plans underway public bathhouse replacing old one at 247 Madison St., (PMS-428), $200,000; addnl.

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garages (PMS-158) $200,000, addnl. shops and offices in new garage (PMS-160) $200,000; sheds and shops, landscaping along 90 St. (PMS-157) $200,000, all foregoing in Municipal Asphalt Plant at 91 St. and East River Dr.; altering bathhouse at 538 E. 11 St., (PMS-429), $185,000. State Aid Planning Funds allotted. CD 1/21—ENR 2/10.

N. Y., New York—President, Manhattan Boro, W. D. Binger, comr. Boro Wks., Municipal Bldg., Zone 17, plans underway Madison St. garage alterations, addn., (PMS-161) $200,000. State Aid Planning Funds allotted.

★**N. Y., New York**—Port of New York Auth., 111 8 Ave., Zone 11, plans underway Union motor truck terminal between Greenwich and Washington Sts., running from Spring to West Houston Sts. $2,500,000.

N. C., Shelby—City, plans, 10% completed by W. W. Hook, Commercial Bank Bldg., Charlotte, fireproof addn. Shelby Hospital. $250,000.

N. D., Minot—State Bd. Higher Educ., Bismarck, plans by Knute A. Henning, Fargo, physical education and health center bldg. $350,000.

★**O., Canton**—Comrs. Stark Co., Hilda Schrantz, clk., Court House, plans completed by H. C. Frank, 203 Market Ave. S., 7 brick, steel schools, $964,654; plans 25% completed hospital and health facilities and public bldg., $785,000; plans 2% completed county bldg., $1,160,000.

O., Canton—Comrs. Stark Co., Hilda Schrantz, clk., Court House, plans by H. C. Frank, 203 Market Ave. S., 3 new school bldgs., and 2 miscellaneous projects. $425,000.

★**O., Cleveland**—City, E. L. Worthington, dir. Pub. Health, City Hall, plans by H. Kregelius, 517 City Hall, 3 health centers, $600,000. Financing not yet provided for.

★**O., Kent**—Kent State University, K. E. Leebrick, pres., plans 5% completed by H. G. Fulton, 6014 Euclid Ave., Cleveland, men's dormitory and students' union bldg. $511,800. CD 7/20—ENR 8/10.

O., Mansfield—Comrs. Richland Co., L. Henry, clk., Court House, tuberculosis sanitorium, $262,500; remodeling court house, providing addnl. rooms for juvenile and probate courts and female quarters in jail, $150,000. Financing not yet provided for. H. C. Sword, Court House, co. engr.

O., Newark—City, plans underway light plant imprvs., turbo generator and remodeling transformer installation, $85,000. C. H. Wells, City Hall, city engr.

Pa., Aliquippa—Beaver Co., Beaver, hospital, $324,000. M. J. Baker, Jr., Rochester, consult. engr.

Pa., Ambridge—Beaver Co., Beaver, hospital. $403,000. M. J. Baker, Jr., Rochester, consult. engr.

Pa., Greene—Twp., 10 room consolidated school. $95,000. Financing not yet provided for, land rights not cleared. M. J. Baker, Jr., Rochester, Pa., consult. engr.

Pa., Hanover—Hanover Two., 6 room consolidated school. $58,600. Financing not yet provided for, land rights not cleared. M. J. Baker, Jr., Rochester, consult. engr.

R. I., Johnston—Town, A. DeMoranville, supt. of schools, plans underway by Oresto DiSala, 703 Gardner Bldg., Providence, brick, steel, high school. $150,000.

Tex., Austin—City, T. Miller, mayor, City Hall, plans 5% completed 3 story, air-conditioned police and courts bldg., $200,000. Associated Architects of Austin, Austin, archts. (Correction-architects). CD 6/28—ENR 8/10.

Tex., Dallas—City, plans 5% completed by G. Dahl, Southland Life Bldg. Annex, records hall building, $150,000.

Tex., Dallas—City and Dallas Co., plans by Dr. C. G. Parnall, consult. archt., 1730 Highland Ave., Rochester, N. Y., expan. bldgs., etc., at Parkland Hospital, 3819 Maple St. $300,000.

★**Tex., Dallas**—City, plans 5% completed, police bldg. $900,000. H. Bartholomew, 317 N. 11 St., St. Louis, Mo., consult. engr.

★**Tex., Dallas**—City, plans 5% completed auditorium, $2,500,000. H. Bartholomew, 317 N. 11 St., St. Louis, Mo., and S. Herbert Hare, Sophian Plaza, Kansas City, Mo., consult. engrs. CD 5/5/43—ENR 5/13/43.

★**Tex., Galveston**—University of Texas, Medical Branch, 912 Strand St., plans by University Architect, general hospital bldg., $2,000,000; main laboratory bldg. addn., $1,000,000; library, auditorium and administration bldg., $300,000; new Rebecca Sealy nurses' quarters unit, $250,000; reserve unit, etc. for power house, $50,000; reserve facilities for water reservoir, $50,000. CD 4/3—ENR 4/20.

★**Tex., San Marcos**—Southwest Texas State Teachers College, San Marcos, plans by H. P. Smith, National Bank Com. Bldg., San Antonio, dormitory, $150,000; fine arts bldg., $150,000; Dormitory Bldg. 1, $150,000; industrial arts bldg., $150,000.

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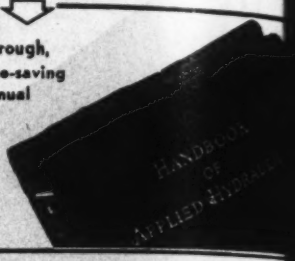

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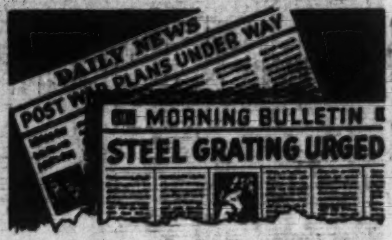

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POSTWAR PROJECTS (Cont'd.)

Tex., Waco—City, bond election soon, auditorium. $100,000. W. F. Smith, City Hall, engr. CD 6/1—ENR 5/15.

Wis., Antigo—City, S. B. Byrne, clk., city hall, $75,000; community center, $100,000; repairing, rebuilding schools, $100,000. H. Olk, city engr.

Wis., Baraboo—Sauk Co., plans by Law, Law, Potter & Nystrom, 121 S. Pinckney St., Madison, 1 story, 80x300 ft. garage, 1 story, 80x100 ft., brick tile repair shop and 2 story, 40x100 ft., brick, tile, office bldg. R. B. Kinney, engr.

Wis., Janesville—Bd. Vocational and Adult Educ., plans by Law, Law, Potter & Nystrom, 121 S. Pinckney St., Madison, 3 story, vocational school. $250,000.

Ont., Port Arthur—Municipality in association with Provincial Govt., plans by architect, Dpt. P. Wks., Toronto, forest school on Sibley Peninsula, $250,000.

COMMERCIAL BUILDINGS

PROPOSED WORK

Ark., El Dorado—Second Baptist Church, El Dorado, church and educational bldg., $150,000. Financing unsettled.

★**Calif., Los Angeles**—Mullen & Bluett, 600 S. Bway., plans store at Wilshire Blvd. and Ridgeley Dr. $1,500,000.

★**Calif., San Francisco**—E. N. Fritz, c/o Park Lane Apts., 1100 Sacramento St., San Francisco, auditorium on northeast corner Ellis and Taylor Sts., site purchased. $1,250,000.

Conn., Southington—Bradley Memorial Hospital, Meriden Ave., 3 story, bsmnt., brick, stone hospital addn. $250,000. Financing not yet provided for.

★**Ind., Indianapolis**—S. C. Bodner, 108 E. Washington St., making preliminary plans, 7 story, 135x199 ft., brick, stone, glass brick, rein.-con. apartment bldg., 3710 N. Meridian St. $750,000. Private plans.

Mass., Danvers—Maple St. Congregational Church, G. H. Erickson, chn. Bldg. Comn., 23 Chester St., plans rebuilding church. Over $150,000.

N. Y., New York—D. S. Meister, 292 Madison Ave., Zone 17, 2 six story apartments, west side of Columbus Ave., from 94 to 95 Sts. $400,000.

N. Y., New York—National Sugar Refining Co., 129-131 Front St., Zone 5, office bldg. on 34x108 ft. site at Wall and Front Sts., northwest corner. Over $150,000.

O., Columbus—B'Nai B'rith Hillel Fdn., Ohio State University Chapter, memorial to Edwin J. Schanfarber serving as religous, cultural and social center for Jewish students. $250,000.

R. I., Barrington—A. Farina, Jr., 501 Main St., Warren, frame home development, Bay Road Section, $150,000.

R. I., Providence—Sons of Israel & David Congregation, Bread and Glenham Sts., brick, stone temple and school, Butler and Orchard Aves., $150,000.

Tenn., Memphis—Sears Roebuck & Co., c/o Walter Acroyd, genl. mgr., 495 N. Watkins St., preliminary plans to start about Feb. 1, 1945, commercial bldg. opposite present plant. Over $150,000.

Tenn., Nashville—First Lutheran Church, c/o Dr. I. W. Gernert, 311 5 Ave., N., church auditorium and classrooms, 3 Ave. and McGavock St. $150,000 to $200,000.

★**Tenn., Nashville**—Life & Casualty Insurance Co., c/o A. M. Burton, 159 4 Ave. N., 10 story, brick, stone, concrete office bldg., Church St. and Fourth Ave. $1,500,000.

Tex., Dallas—W. W. Caruth, Jr., 1215 Main St., plans shopping center. $150,000.

Tex., Dallas—Kessler M. E. Church, 954 N. Windomere St., plans church. $150,000.

Tex., Dallas—St. Paul Hospital, 3121 Bryan St., hospital wing. $275,000.

Tex., Houston—F. L. McNeny, First National Bank Bldg., shopping center on 33 acre site on Cedar Springs Rd. off Lemmon St. $300,000.

Tex., Houston—St. Elizabeth Negro Hospital, c/o N. Dietrich, Gulf Bldg., hospital. $150,000. Raising funds.

Tex., Houston—Second Baptist Church, Milam and McGowen Sts., educational bldg. $200,000.

★**Tex., Temple**—U. S. 36th Div. Memorial Assn., Temple, and c/o J. R. Pelich, 1103 Comm. Standard Bldg., Houston, 36th Div. Memorial bldg., $500,000. Competitive competition this month to select architect. CD 3/2—ENR 3/23.

Tex., Tyler—Citizens National Bank, Tyler, brick, rein.-con. office and bank bldg. $150,000.

Wash., Seattle—Sterling Theaters, Inc., Palomar Bldg., Zone 1, theater in Magnolia Bluff Dist. $200,000.

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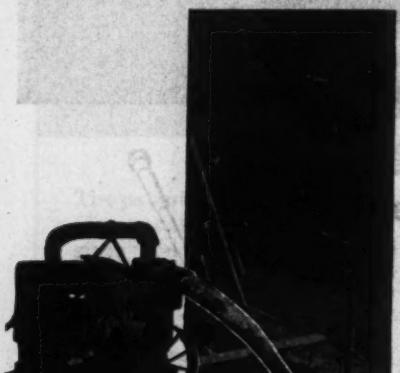

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POSTWAR PROJECTS (Cont'd.)

★**Alta., Edmonton**—University of Edmonton, Dr. R. Newton, pres., student union bldg. $600,000.

PLANS UNDERWAY

Calif., Bakersfield—Barker Bros. Corp., 818 W. 7 St., Los Angeles, plans by Stiles Clements, 1235 Van Nuys Bldg., 2 story, mezzanine, basmt., 115x265 ft., concrete frame, and reinforced brick store bldg. Over $150,000.

Calif., Beverly Hills—Saks 5th Ave. Store, 9600 Wilshire Blvd., sketches by P. R. Williams, 3757 Wilshire Blvd., Los Angeles, 1 story, 150x130 ft., rein.-con. bldg. addn. Over $150,000.

Calif., Inglewood—Sears Roebuck Co., 2626 E. Olympic Blvd., Los Angeles, plans by Stiles Clements, 1235 Van Nuys Bldg., Los Angeles, 2 story, rein.-con. or reinforced brick store bldg. $300,000-$500,000.

★**Calif., Los Angeles**—May Co., 801 S. Bway., Los Angeles, working drawings by A. C. Martin, 225 Higgins Bldg., and S. A. Marx, 333 N. Michigan Ave., Chicago, Ill., remodeling existing bldg. $500,000.

Conn., Derby—The Griffin Hospital, Seymour Ave., plans underway by L. A. Walsh, 111 W. Main St., Waterbury, brick, steel, hospital addns. and imprvs. $400,000. CD 5/18—ENR 5/18.

★**Ill., Centralia**—Centralia Real Estate, Inc., F. T. Egan, 311 E. Bway., plans completed by Charles Wheeler Nicol, 59 E. Van Buren St., Chicago, 8 story, 80x105 ft., concrete, brick veneer hotel, Bway. and Poplar Sts. $750,000. Financing not yet provided for.

Ind., South Bend—Crown Development Co., South Bend, plans 20% completed 30 homes, $6,000 each.

★**Ia., Des Moines**—Iowa Methodist Hospital, R. A. Nettleton, admn., preliminary plans by Wetherell & Harrison, Shops Bldg., hospital addn. $500,000.

★**Md., Baltimore**—S. M. Pistorio, Knecht Ave. and Penn. R. R. Carroll Station, plans 10% completed 1,000 two story, frame residences on both sides Belvidere Ave. and Loch Raven Blvd., $2,500,000; 150 two story brick residences on Herring Run Dr. in Hamilton Section, $600,000; 25 two story brick residences on Frederick Rd., in Winston Section, $150,000; 50 two story, brick residences on Edmondson Ave., in Westowne Section, $350,000.

Mass., Holyoke—Young Men's Christian Assn., 367 High St., plans underway by Tessler & Maloney, 220 Dwight St., Springfield, brick, steel Y. M. C. A. bldg., on Pine St., gymnasium and swimming pool. $400,000. CD 6/7—ENR 6/15.

★**Mich., Flint**—Woman's Hospital, Flint, preliminary plans underway by Perry W. Swern & Assoc., 19 S. La Salle St., Chicago, Ill., hospital bldg., power house. $815,000.

N. J., Elizabeth—Young Women's Christian Assn., 274 Broad St., plans by C. Godfrey Poggi, 287 Morris Ave., and L. E. Jallade, 597 5 Ave., New York, N. Y., Y. W. C. A. bldg., $250,000. CD 5/9—ENR 5/18.

★**N. Y., Brooklyn** — St. Rosalia Roman Catholic Church, Rt. Rev. Mgr. A. R. Ciom, pastor, 1230 65 St., plans completed by A. J. DePace, 151 W. 46 St., New York, Zone 19, 1 story, brick church, 1210-24 65 St., $425,000; 3 story, brick convent, 1236-46 65 St., $75,000.

★**N. Y., Forest Hills**—Syndicate, P. Lipstein, pres., c/o A. Weiser, archt., 246 Madison Ave., Zone 12, plans completed garden type apartment house, 108 St., 76 Ave., 76 Rd. and Yellowstone Blvd., $1,115,000.

★**N. Y., Forest Hills**—Wolsum Realty Co., c/o M. Rothstein & Sons, archts., 132 Fulton Ave., Brooklyn, Zone 1, plans completed 6 story 150x200 ft. apartment, 98 St., southeast corner 64 Rd. to 65 Ave., $504,000.

N. Y., New York—Ace Holding Corp., 1447 Bway., Zone 18, plans completed by A. Goldhammer, 6 Varick St., Zone 13, apartment 582—44 W. 218 St. $350,000.

★**N. Y., New York**—Astor Estate, 21 W. 26 St., Zone 10, plans by Walker & Gillette, 19 E. 53 St., Zone 22, 13 story penthouse, 103 x 150 ft. office bldg., 440 Ave., N.W. corner 51 St. $1,062,000.

N. Y., New York—A. Bandes & C. Nemerson, 691 Gerard Ave., Zone 51, plans completed by H. I. Feldman, 415 Lexington Ave., Zone 17, 6 story apartment house at 2260 Grand Concourse, $300,000.

N. Y., New York—M. P. Campagna, 4867 Arlington Ave., plans completed by R. Candela, 110 E. 42 St., Zone 17, 30 houses on Arlington Ave., 249 St. and Henry Hudson Parkway, $284,500.

★**N. Y., New York**—Sidney R. and Arthur Diamond, 570 Lexington Ave., Zone 22, plans completed by Boak & Raad, 176 Ave., Zone 10, 10 story, 125x183 ft., apartment, 211 E. 78 St. $500,000.

N. Y., New York—Digby Management Corp., 1450 Bway., New York, 18, plans by H. I. Feldman, 415 Lexington Ave., New York, 17, 6 story, apartment at 3235 Hull Ave. $150,000.

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POSTWAR PROJECTS (Cont'd.)

★**N. Y., New York**—Emigrant Indust... Savings Bank, 51 Chambers St., Zone ... plans completed by H. I. Feldman, 415 Le... ington Ave., Zone 17, 5 story apartme... houses at 160-68 E. 110 St., $175,000; 616-... W. 173 St., corner Bway., $170,000; 602-... 146 St., corner Bway., $16...,000.

★**N. Y., New York**—Federal Reserve Ba... of New York, 89-97 Maiden Lane, Zone ... plans completed by York & Sawyer, ... Park Ave., Zone 17, adding 5 stories to bld... at 89 Maiden Lane, alterations, repa... $750,000.

★**N. Y., New York**—E. Friedlander, B. ... Nemeroff, E. I. Latter, c/o E. J. Moelle... archt., 347 Madison Ave., Zone 17, plans co... pleted 40 story office bldg., with 2 story pen... house at southwest corner 6 Ave. and 39 St... $3,000,000.

N. Y., New York—Goodal Holding Cor... c/o H. I. Feldman, archt., 415 Lexingt... Ave., Zone 17, plans completed 12 sto... penthouse, apartment, on 96x109 ft. s... 204-210 E. 47 St. $350,000.

★**N. Y., New York**—Greenwich Savin... Bank, 36 St. and Bway., Zone 18, pla... completed by V. Mayper, 110 W. 40 S... Zone 18, 22 story, 140x230 ft. office a... loft bldg., 709-719 Third Ave., blockfro... from E. 44 to E. 45 Sts., $1,500,000.

N. Y., New York—Geo. S. Gregory & ... Shapiro, c/o DeYoung, Moscowitz & Rose... berg, archts., 205 E. 42 St., Zone 17, pla... completed 12 story, penthouse, 100x102 f... apartment bldg., 3-7 E. 71 St. $400,000.

★**N. Y., New York**—W. A. Helmerich, c/... Emery Roth & Sons, archts., 18 E. ... St., Zone 17, plans completed 18 story a... penthouse, apartment, 54 St. and 2 Av... $600,000.

★**N. Y., New York**—L. Katz, 160 Centr... Park S., Zone 19, plans completed ... S. Bien, 1860 Bway., Zone 23, 14 story, pen... house apartment bldg., at 657 Madison Ave... on 89x100 ft. plot, northeast corner 60 ... $500,000.

★**N. Y., New York**—Beatrice J. Longstre... c/o Shreve, Lamb & Harmon, archts... 11 W. 44 St., Zone 18, plans completed ... story, penthouse department store bldg... on 112x192 site, 5 Ave. and 51 St. $2,...

N. Y., New York—120 E. 79 St., S. Mins... off., pres., 521 Fifth Ave., plans complete... by Bien, 9 E. 46 St., Zone 17, 19 story... 71x82 ft. apartment house, 116 E. 79 ... $450,000. D. Gutman, 1860 Bway, Zone 2... engr.

★**N. Y., New York**—217 Holding Corp., ... Dreier, treas., 222 W. 46 St., Zone 1... plans completed by H. I. Feldman, 415 Lex... ington Ave., Zone 17, 12 story, penthouse... apartment, 216-224 W. 58 St., $560,000; ... story, penthouse apartment, 217-219 W. ... St., $300,000.

N. Y., New York—1350 Sixth Ave. Corp... E. A. Daitz, pres., c/o L. A. Abramso... archt., 25 W. 45 St., New York, Zone 1... plans completed 2 story, 95x100 ft., theatr... and business bldg., 1350-1358 6 Ave., $300,...

★**N. Y., New York**—The New York Time... Co., & V. Astor, 229 W. 43 St., Zone 1... plans completed by Shreve, Lamb & Harmo... 11 W. 44 St., Zone 18, 11 story office bldg... at 216-32 W. 44 St., $2,250,000.

★**N. Y., New York**—Rhode Island Corp... P. A. Carroll, 18 E. 47 St., New York... Zone 17, plans completed by Walker & Gil... lette, 19 E. 52 St., New York, 22, 18 stor... and penthouse apartment bldg., Park Ave... 55 St. and 56 St. $2,100,000.

★**N. Y., New York**—Rockefeller Cente... Inc., 50 Rockefeller Plaza, Zone 20, plan... completed by Carson & Lundin, c/o owner... 16 story office bldg., at 15-21 W. 51 St., run... ning through to 22-28 W. 52 St., $1,750,00... CD 5/9—ENR 5/18.

★**N. Y., New York**—Seamen's Bank fo... Savings, 74 Wall St., Zone 5, plans com... pleted by E. J. Hurley, c/o owner, 14 story... penthouse apartment bldg., 643-55 Lexingto... Ave. corner 55 St. $1,650,000.

★**N. Y., New York**—20 E. 74 St., Inc., ... Minskoff, pres., 521 Fifth Ave., plan... completed by S. Bien, 9 E. 46 St., Zone 1... 15 story, 117x143 ft. apartment house, Madi... son Ave. and 74 St., $550,000. D. Gutman... 1860 Bway, Zone 23, engr.

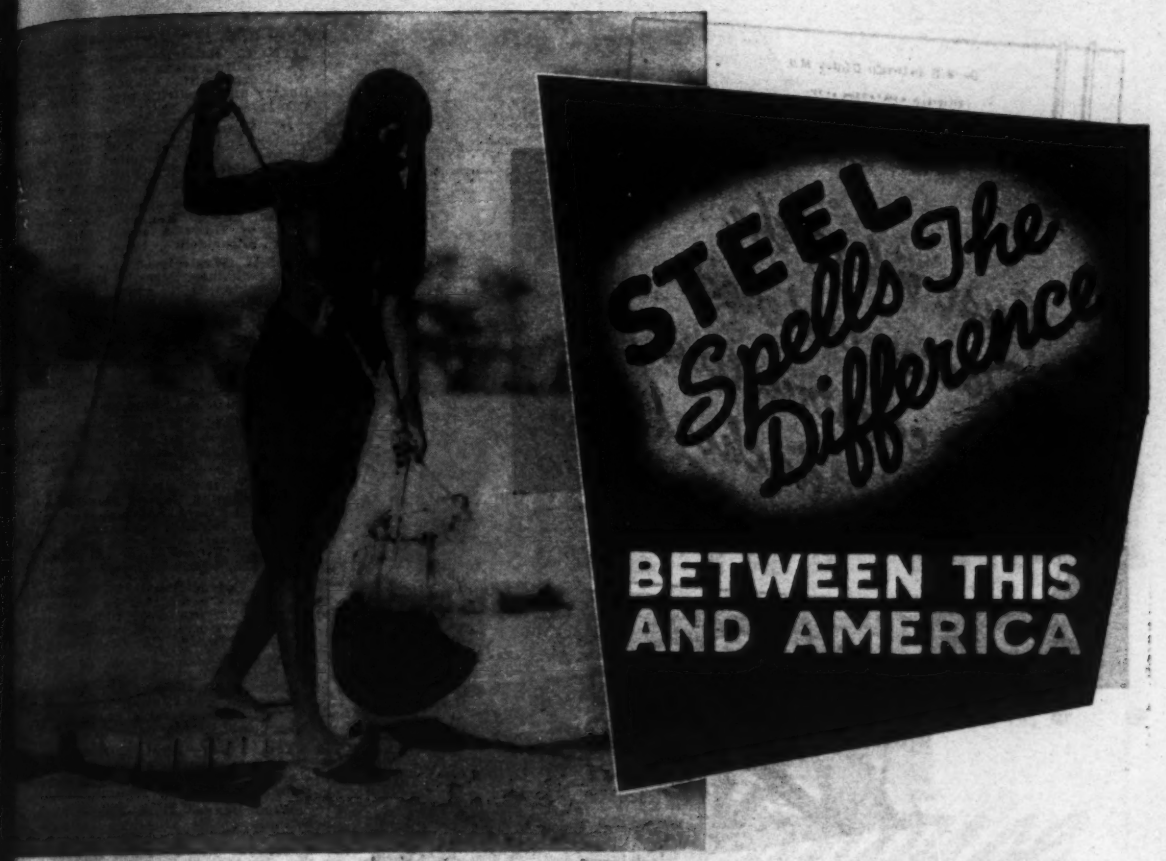
N. Y., New York—Westport Managem... Corp., c/o H. I. Feldman, archt., 415 Le... ington Ave., Zone 17, plans completed ... story, penthouse apartment bldg., 316-18 ... 84 St. $450,000.

★**N. Y., Rego Park**—Kali Court Corp., ... M. Rothstein & Sons, archts., 391 Fu... Ave., Brooklyn, Zone 1, plans complete... 6 story apartment, Booth St., southe... corner 67 Drive to 68 Ave. $504,000.

★**N. Y., Ridgewood**—F. C. Trump, ... Seelig & Finkelstein, archts., 153 Pier... St., Brooklyn, Zone 2, one hundred ... family housing development. $500,000.

N. C., High Point—American Legion, ... Point, plans 100% completed, library, ... 000.

N. C., Lexington—Davidson Hospital, ... Lexington, plans by C. C. Hartman, Gre... boro, 3 story, hospital, E. Center ... $250,000. CD 4/27—ENR 5/18, under P... Bldgs. Post War



THIS Arabian girl is drawing water from a well in the Sahara desert--just as her ancestors did five thousand years ago. Like millions of other women in foreign lands today, she is sentenced to a lifetime of hard labor through lack of steel and time-saving equipment built from steel, which makes American civilization what it is.

Most of us whose homes, offices and workshops are piped with hot and cold water never think of scenes like this. Yet in many other countries such primitive conditions still exist, and water for drinking, cooking, bathing, washing clothes, cultivating crops, and in fact for all purposes, has to be raised and carried by human hands.

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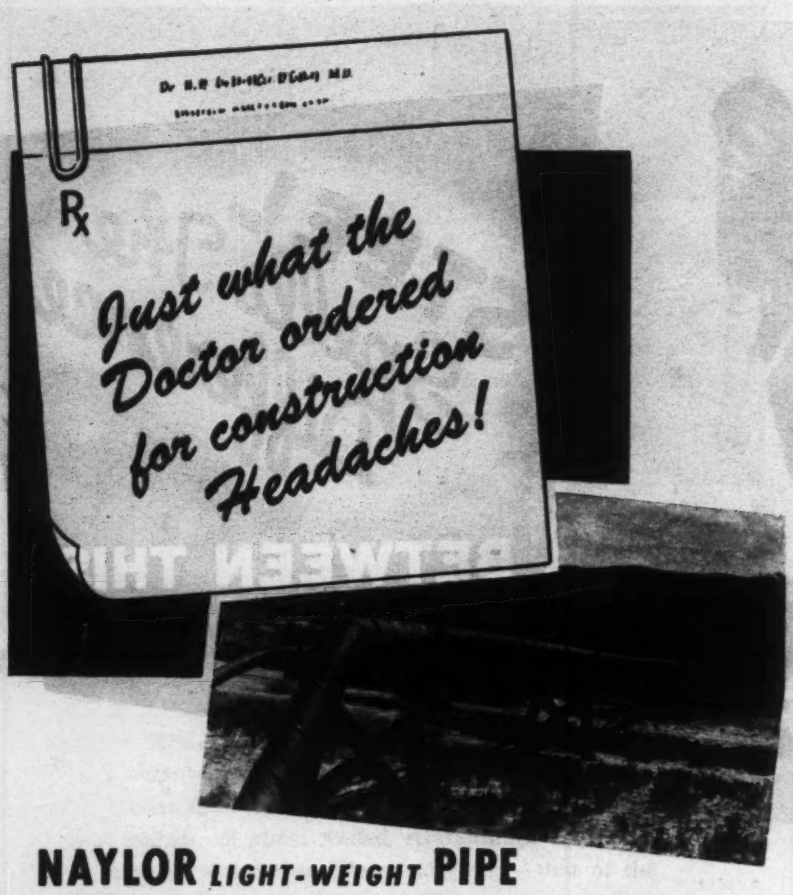

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POSTWAR PROJECTS (Cont'd.)

★**N. C., Raleigh**—Meredith College, Hi… boro Rd., plans by Wm. H. Deitrick, … W. Morgan St., chapel, gymnasium, … library and repairing present bldgs. $… CD 12/8—ENR 12/16.

O., Youngstown—Youngstown Comm… Center, J. R. Goldstein, in charge, plans … derway by M. W. Scheibel, Realty Bldg., … Jewish Community Center, Wick Ave. $1… 000 or more. Most of financing completed.

R. I., Cranston—Phillips Memorial Bap… Parish, G. M. Kenney, chn. Bldg. Co… plans by Howe & Prout, 1016 Turks He… Bldg., Providence, brick church. $150,0…

R. I., Westerly—Young Men's Christ… Assn., Thomas Perry, 2 Margin St., preli… inary plans brick, stone, YMCA bldg. C… $150,000.

Tex., Brownsville — Texas Managem… Engineers, M. H. Kidder, Esperson Bld… plans 10% completed community and rec… tion center incl. 25x100 ft. pavilion, 6… ft. olympic swimming pool, 860x1,000 … park, 300x350 ft. midway, athletic cou… wading pool, etc. $350,000.

Tex., Corpus Christi—Park Ave. Bap… Congregation, Corpus Christi, plans, 10% co… plete by E. E. Hamon, 715 S. Tancahua … 2 story, educational bldg. $150,000.

★**Tex., Dallas** — Southwestern Medi… Foundation Center, 3301 Junius St., pl… by Geo. L. Dahl, Southland Life Annex, … Dr. C. G. Parnall, consultant, 1730 Highla… Ave., Rochester, N. Y., medical center, … acre site, Hines Blvd. $1,500,000 for $… unit. $25,000,000 ultimate cost.

Tex., Galena Park—E. Middleton, Gal… Park, plans completed by Hedrick & Lin… ley, 811 So. Standard Bldg., Houston, m… cantile or stores bldg. $150,000. CD 7/1… ENR 7/13 under CA, Commercial Bldgs.

★**Tex., Houston**—Memorial Hospital, … Lamar St., plans by K. Franzheim, … Crawford St., hospital, $300,000-$400,0… dormitory and dining quarters, $225,0… plans laboratory and therapy bldg., $1… 000; power plant unit, facilities, $75,000

Tex., Pharr—First Methodist Church C… regation, Pharr, plans, 10% complete, … E. A. Noonan, 301 Am. Hospital & L… Bldg., San Antonio, church. $150,000.

Wis., Beaver Dam—School Sisters of … Francis of St. Joseph's Convent, 1941 … Layton Blvd., Milwaukee, plans by Brust … Brust, 135 W. Wells St., Milwaukee, Zone… two 40x150 ft., brick, rein.-con. hosp… wings, 42x60 ft. chapel.

★**Wis., Racine**—St. Lukes Hospital, … College Ave., plans by Schmidt, Gar… & Eriksen, 104 S. Michigan Ave., Chica… Ill., brick, stone, rein.-con., steel hosp… addn., remodeling, $600,000.

N. S., Dalhousie—Dalhousie Univers… Dalhousie, plans by R. L. Fairn, Wolfvi… arts building. $150,000.

INDUSTRIAL BUILDINGS

PROPOSED WORK

N. H., Manchester—PLANT—H. P. Ho… & Sons, 500 Rutherford Ave., Charlestow… Mass., brick, steel, concrete milk process… plant, Lake Ave., $50,000.

★**O., Akron**—LABORATORY—B. F. Go… Field Materials Co., 1524 Maury St., pl… research plant laboratory, over $500,000.

★**Tenn., Memphis**—PLANT—Internatio… Harvester Co., Inc., J. C. McGann, m… Construction & Engineering Div., 180 … Michigan Ave., Chicago, Ill., mfg. plant … 260 acre site, east bank Loosahatchie Ri… 4 mi. north of here. $3,000,000.

Tex., Houston—PLANT—Dr. Pepper B… tling Co. of Houston, 38 Reisner St., bott… plant and storage, Greenville St., Mocki… bird Lane and MK&T Ry., tracks. $300,0…

Tex., Houston—PLANT—Jno. A. Roeblin… Sons Co., 6212 Navigation Blvd., wire prod… mfg. plant imprvs. Over $40,000.

Tex., New Braunfels—PLANT, etc.—… Caugh Hosiery Mills, New Bransfels, … hosiery mfg. plant, facilities, etc., $100,0…

Tex., San Antonio — PLANT — Sha… Wood Co., 1600 White St., Houston, awa… mfg. plant, S. Laredo St., $100,000. Site … chased.

★**B. C., Vancouver**—PLANT—Canada … Ginger Ale, Ltd., 153 Sherbourne St., … ronto, Ont., beverage mfg. plant, $300,0…

★**Ont., Espanola**—PULP MILL—Kalama… Vegetable Parchment Co., Kalamaz… Mich., converting former Abitibi Power … Paper Co., Ltd., mill on Spanish River … sulphate pulp mill, $5,000,000. CD 1/14/… ENR 1/21/43, under Industrial Bldgs.

Ont., Sarnia — PLANT — Sarnia S… Water Works, Ltd., 118 North Victoria … plant, about $75,000.

★**Que., Montreal** — PLANT, etc. — Cr… Ltd., c/o A. P. Darcel, 1170 Beaver … Square, plant, foundry addns., imp… $300,000.

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POSTWAR PROJECTS (Cont'd.)

Que., Montreal—PLANT—Drummond McCall & Co., Ltd., 930 Wellington St., plant addns. $75,000.

Que., Montreal — FACTORY — Neo-Ped Footwear Products, Ltd., 77 W. Vitre St., factory. $40,000.

Que., Montreal — FACTORY — The Zabre Footwear Mfg. Co., Ltd., 987 Cote St., factory. $40,000.

PLANS UNDERWAY

Minn., St. Paul—GARAGE—Sixth and St. Peter Corp., R. E. Albrecht, secy.-treas., c/o L. J. Johnson, archt., 223 Hamm Bldg., converting theatre bldg. at 6 and Peter Sts., into 3 story, ramp storage garage, with tunnel connections under 6 St., serving department store, furrier store and office bldg. $40,000.

★**N. Y., New York**—BOTTLING PLANT—Jacob Ruppert Corp., 1639 3 Ave., New York, Zone 28, plans completed by W. M. Schuler, c/o Owner, 6 story, 201 x 220 ft., bottling and storage plant, 1741-1747 2 Ave., $2,000,000.

★**Tex., Houston** — PLANT — Houston Oil Field Materials Co., 1524 Maury St., plans by M. Moore, 2008 W. Alabama, expan chemical mfg. plant, $900,000.

Tex., San Antonio—WAREHOUSE, etc.—Sommers Drugs, 223 Losoya St., plans 75% completed by Adams & Adams, Builders Exchange Bldg., San Antonio, 3 story, 130x160 ft. warehouse, office and training school bldg. $150,000.

UNCLASSIFIED

PROPOSED WORK

★**Alabama** — PARK IMPROVEMENTS — State Dpt. Conservation, B. C. Morgan, Conservation Dir., Montgomery, plans 60 addnl. cabins, 30 room hotel, at Gulf State Park, $250,000; 20 addnl. cabins, 20 room hotel addn., swimming pool, Cheaha Mountain, Cheaha State Park $300,000; 10 addnl. cabins, recreation hall, general imprvs., DeSoto State Park, $150,000; 15 addnl. cabins, dining room, assembly hall and lake imprvs., Chewacla State Park, $125,000; 10 addnl. cabins, swimming pool, Monte Sano State Park, $85,000; 20 addnl. cabins, 2 addnl. lakes, Oak Mountain State Park, $100,000; reconstructing barracks into hotel and addnl. cabins, Fort Morgan, $100,000.

Ala., Birmingham—STADIUM—City Bd. Educ., L. Fraser Banks, supt., design stage stadium at Ensley High School, $150,000.

Ark., Fort Smith—RECREATIONAL PARK—Sebastian Co., Fort Smith, recreation park, $42,050.

†**Calif., Mt. Hamilton** — REFLECTING TELESCOPE, etc.—University of California, Mt. Hamilton, reflecting telescope, $900,000; fire protection and rehabilitation of bldgs., $75,000.

Calif., San Bernardino—RADIO STATION—Sun Co. of San Bernardino, San Bernardino, FM. radio station. Over $25,000.

Calif., San Francisco—RADIO STATION—Don Lee Broadcasting Sys., KFRC, 1000 Van Ness Ave., FM radio station. Over $25,000.

Calif., San Francisco—RADIO STATION—National Broadcasting Co., KPO, 111 Sutter St., FM radio station. Over $25,000.

Colo., Denver—RADIO STATION—National Broadcasting Co. KOA, 1625 California St., FM radio station. Over $25,000.

Conn., East Haven — BEACH IMPROVEMENTS—Town, J. J. Sullivan, first selectman, Town Hall, beach imprvs., Momaugin. Over $35,000.

Conn., Fairfield — TELEVISION STATION—Connecticut Television Co., R. C. Power, pres., Darien, television station bldg., 515 ft. steel tower. $300,000.

Conn., Milford—PARK IMPROVEMENTS—Town H. M. Merwin, First Selectman, Town Hall, Wilcox Park imprvs., incl. field house and athletic field. Over $35,000.

Conn., Wallingford—AIRPORT—Town and Borough of Wallingford, J. A. McGuire, clk., municipal airport, Pond Hill. $50,000. Financing not yet provided for.

Del., Wilmington—RADIO STATION—WDEL, Inc., 10 and King Sts., FM radio station. Over $25,000.

D. C., Wash.—RADIO STATION—Capital Broadcasting Co., WWDC, 1000 Connecticut Ave. N.W., FM radio station. Over $25,000.

D. C., Wash.—RADIO STATION—Evening Star Broadcasting Co., WMAL, 724 14 St. N.W., FM radio station. Over $25,000.

D. C., Wash.—RADIO STATION—National Broadcasting Co., WRC, 724 14 St., N.W., FM radio station. Over $25,000.

Fla., Jacksonville — RADIO STATION — Florida Broadcasting Co., WMBR, 118 W. Adams St., FM radio station. Over $25,000.

Ill., Cairo — LIGHTING — City, lighting state hy. through city. $37,500.

Ill., Chicago—RADIO STATION—National Broadcasting Co. WMAQ, 223 W. North Bank St., FM radio station. Over $25,000.

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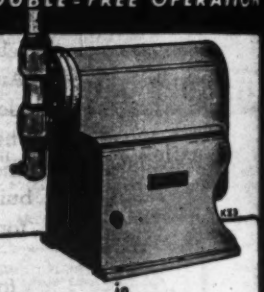

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POSTWAR PROJECTS (Cont'd.)

Ill., Chicago—RADIO STATION—Chicago Federation of Labor, WCFL, 666 N. Lake Shore Dr., FM radio station. Over $25,000.

Ill., DuQuoin — SWIMMING POOL — City Hall, open air, concrete municipal swimming pool northeast of Marshall Browning Hospital on land leased from Illinois Central R.R. $25,000. J. C. Gibson, Pinckneyville, co. supt. hys.

Ill., Springfield—Bd. Educ., 200 E. Adams St., plans surfaced playgrounds, flood lighting equipment, McClernand School area, and Enos Sts., DuBois School Area, Lincoln and Washington Sts., Iles School Area, and Laurel Sts., Enos School Area, Bond and Elliott Sts. $25,000 each.

Indiana — ELECTRIC LINES — DuBois Rural Electric Co-Operative Assn., E. Connor, Jasper, addnl. 200 mi. electric lines in Dubois and Crawford Counties. $50,000.

Ind., Brazil — SWIMMING POOL — City swimming pool addn. $30,000.

Ind., Green Castle—AIRPORT—City, W. Ballard, Mayor, City Hall, enlarging airport $50,000 or more.

Ind., Indianapolis—RADIO BROADCASTING STATION—Indianapolis Broadcasting Inc., WIRE, Claypool Hotel, FM radio broadcasting station. Over $25,000.

Ind., Indianapolis — RADIO STATION — WFBM, Inc., Monument Circle, FM radio station. Over $25,000.

Ia., Cedar Rapids—RADIO BROADCASTING STATION—Gazette Co., 500 3 Ave. S.E., FM radio broadcasting station. Over $25,000.

Ia., Dubuque—RADIO STATION—Telegraph Herald KDTH, 346 8 Ave., FM radio station. Over $25,000.

Ind., Hammond—RADIO STATION—Radio Station WJOB, 447½ State St., FM radio station. Over $25,000.

Ia., Humboldt—SWIMMING POOL—City, H. F. Jakway, clk., City Hall, approved $30,000 bond issue, swimming pool.

La., Alexandria—AIRPORT, etc.—City, civilian airport $150,000; park stadium $55,000.

La., New Orleans—RADIO STATION—Times Picayune Pub. Co., 615 North St., FM radio station. Over $25,000.

Me., Dead River—FISH HATCHERY, etc.—State, Geo. J. Stobie, comr. Inland Fisheries & Game, Augusta, fish hatchery and cold storage plant at Ledge in Kennebec River waters. Over $50,000. Financing not yet provided for.

Md., Baltimore—RADIO STATION—Baltimore Radio Show, Inc., WFBR, 10 E. North Ave., FM radio station. Over $25,000.

Md., Baltimore—RADIO STATION—Monumental Radio Co., WCAO, 811 W. Lanvale St., FM radio station. Over $25,000.

Md., Salisbury — RADIO STATION — Peninsula Broadcasting Co., Salisbury, FM radio station. Over $25,000.

Mass., Boston—RADIO STATION—Mathewson Radio Co., Inc., WHDH, Hotel Touraine, FM radio station. Over $25,000.

Mass., Fall River—RADIO STATION—Doughty & Welch Electric Co., WSAR, 45 Borden Blk., FM radio station. $25,000.

Mass., Lawrence—PARK IMPROVEMENT—City, J. W. McCarthy dir. Engineering, City Hall, clearing, grading, seeding, interior walks, concrete curbing and walks, shrubbery, Four Acre Park entering city limits bounded by Osgood St., North Park Rd. and Salem Turnpike, $12,900; completing Memorial Park, incl. horseshoe footh stand, $200,000; swimming pool, $55,0 baseball stand and bleachers, 3 tennis cour walks and drives, tree planting, wadi pool, baseball diamond, football practi field, curbing and concrete walks, $154,0 Funds appropriated for preliminary surve

Mass., Lawrence—RADIO STATION—Hildreth & Rogers Co., WLAW, 278 Essex St., FM radio station. Over $25,000.

Mass., Medford—PARK DEVELOPMENT—City, W. Lawrence, mayor, City Hall, plans 3 parks, at Medford, Hillside and Fulton Heights, incl. playground, etc., construction 3 swimming pools, bldgs. and showers $100,000. Private plans.

Mass., New Bedford—RADIO STATION—E. Anthony & Sons, Inc., 575 Pleasant St., FM radio station. Over $25,000.

Mass., Pittsfield—RADIO STATION—Moroe B. England (WBRK), 2 Bank Row, FM radio station. Over $25,000.

Mass., Quincy—STADIUM BLEACHERS—City, C. Ross, mayor, Municipal bldg., addnl. concrete bleachers, stadium, garage $50,000.

Mass., Worcester — RADIO STATION — Worcester Telegram Pub. Co., WTAG, 2 Franklin St., FM radio station. $25,000.

Mich., Dearborn—RADIO STATION—J. Radner, WIBM, Dearborn, FM radio station. Over $25,000.

Mich., Detroit—RADIO STATION—James F. Hopkins, Inc., WJBK, 6559 Hamilton Ave., FM radio station. Over $25,000.

Mich., Detroit—RADIO STATION—King-Trendle Broadcasting Corp., Stroh Bldg., FM radio station. Over $25,000.

...WAR PROJECTS (Cont'd.)

...Detroit—RADIO STATION—WJR, ...Goodwill Station, Fisher Bldg., FM radio ... Over $25,000.

...Grand Rapids—RADIO STATION—...Trendle Broadcasting Corp., Grand ...s National Bank Bldg., FM radio sta... Over $25,000.

...St. Joseph — RADIO STATION — ...Inc., Schneider Bldg., FM radio sta... Over $25,000.

...Columbia—AIRPORT—City, airport, ...,000.

...St. Louis—PARK IMPROVEMENTS. ...—City, c/o M. M. Kinsey, pres., Bd. ..., 104 City Hall, 12 and Market Sts., ... voted $750,000 bond issue construct... and reconstructing, developing Zoologi... Gardens in Forest Park; voted $9,297,000 ... impry. airport. Addnl. $4,103,000 ...ble; voted $3,625,000 bonds impry. ... parks, squares, playgrounds, recrea... fields and community centers, etc., ...,000 also available; voted $2,200,000 im... fire and police telegraph and telephone ...central station. CD 6/22—ENR 7/13.

...St. Louis—RADIO STATION—Colum... Broadcasting System, Inc., 401 S. 12 St., ... radio station. Over $25,000.

...St. Louis—RADIO STATION—Globe ...ocrat Publishing Co., 1133 Franklin St., ... radio station. Over $25,000.

...St. Louis—RADIO STATION—Pulitzer ...shing Co., KSD, 12 and Olive Sts., FM ... station. Over $25,000.

...St. Louis—RADIO STATION—Star... ...t Publishing Co., KXOX, 12 and Del... Sts., FM radio station. $25,000.

...St. Louis—RAILROAD TRACKS ...RELOCATION, etc.—City, c/o M. M. ..., pres. Bd. P. Service, 305 City Hall, ... Market Sts., Zone 2, and Terminal ...road Assoc. of St. Louis, P. J. Watson, ... Union Station, 1300 Market St., Zone ...location elevated railroad tracks along ... front between Eads and Douglas Mac... Municipal Bridge; railroad tunnel ... 2 St.; remove surface tracks along ... front in Jefferson National Expansion ...rial area, $15,000,000-$23,000,000.

...Omaha—RADIO STATION—World ...shing Co., KOWH, World Herald Bldg., ..., FM radio station. Over $25,000.

...York—BATHHOUSE—Dpt. P. Wks., ... Office Bldg., Albany, Zone 1. CON-2, ...house at Fairhaven Beach State Park, ...Finger Lakes State Park Comn., Con... ...tion Dpt., $55,000.

...Y., Albany—RADIO STATION—WOKO, ... 3 Elk St., FM radio station. Over ...,000.

...Y., Buffalo—RADIO STATION—WEBR, ... 23 North St., FM radio station. Over ...,000.

...Y., Ithaca—RADIO STATION—Cornell ...versity, WHCU, Savings Bank Bldg., ... radio station. Over $25,000.

...Y., New York—RADIO STATION— ...erican Network, Inc., 60 E. 42 St., Zone ... FM radio station. Over $25,000.

...Y., New York—RADIO STATION—Blue ...work, Inc., WJZ, 30 Rockefeller Plaza, ... 20, FM radio station. Over $25,000.

...Y., New York—RADIO STATION— ...ter New York Broadcasting Co., 501 ...son Ave., Zone 22, FM radio station. ... $25,000.

...Y., New York—RADIO STATION— ...st Radio, Inc., WINS, 25 W. 42 St., ... 18, FM radio station. Over $25,000.

...Y., New York—RADIO STATION—Na... ...al Broadcasting Co., WEAF, 30 Rocke... ...r Plaza, Zone 20, FM radio station. ... $25,000.

...Y., New York—RADIO STATION— ...n Syndicate Co., Inc., 22 E. 42 St., Zone ... FM radio station. Over $25,000.

...Y., New York—RADIO STATION— ...WX Broadcasting Co., 260 E. 161 St., Zone ... FM radio station. Over $25,000.

...Y., New York—RADIO STATION— ...CA, Inc., 1657 Bway., Zone 19, FM radio ... Over $25,000.

...Y., Ossining—PLAY AREA—Village, de... ...opment Bway. play area. $29,050. State ... Planning Funds allotted.

...Y., Rensselaer—ATHLETIC FIELD— ...development high school athletic field, ...00. State Aid Planning Funds allotted.

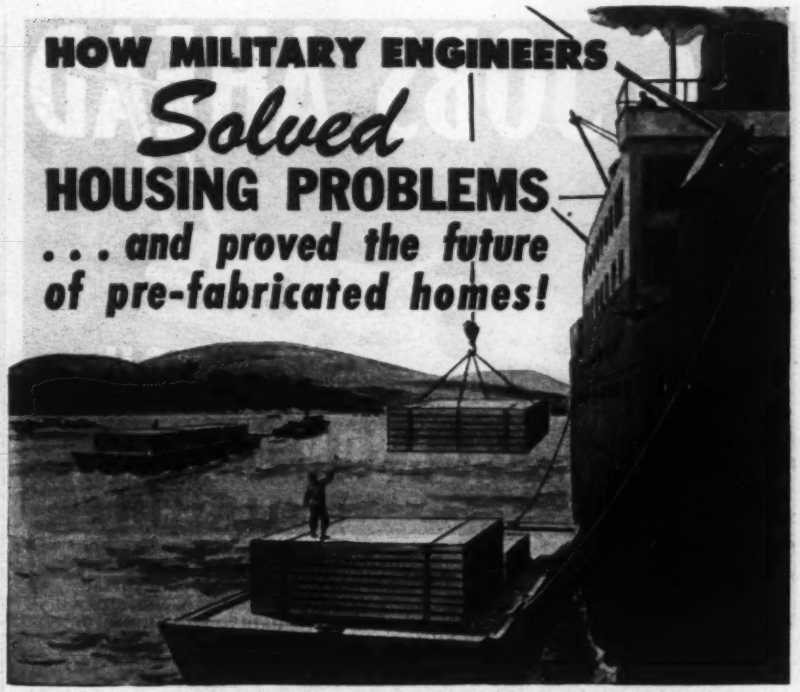
...Y., Syracuse—RADIO STATION—Cen... New York Broadcasting Corp., Syracuse ... FM radio station. Over $25,000.

...Y., Syracuse—RADIO STATION—On... ...da Radio Broadcasting Corp., WFBL, ...ton and Jefferson Sts., FM radio station, ...00.

...Y., Utica—BROADCASTING STATION ...IBX, Inc., 137 Genesee St., FM broad... ...g station at Smith Hill, $25,000.

...Y., Watertown — BROADCASTING ...TION—The Brockway Co. WWNY, 49 ...k Square, FM radio broadcasting sta... ...east of here. Over $25,000.

HOW MILITARY ENGINEERS *Solved* HOUSING PROBLEMS ... *and proved the future of pre-fabricated homes!*



Officers who specified Dallas Huts for the housing of their personnel did more than provide weather-proof, comfortable living quarters for the men — they *proved* the practicability of fully pre-fabricated housing in all climates!

Because of their sturdy construction, Dallas Huts in all probability will far outlast their wartime tasks — then they will be ready for use as rehabilitation housing for the people of devastated lands. The fact that Dallas Huts are 100% salvageable and easily demounted for quick transportation makes them especially valuable for this use.

YOU MAY OWN ONE AFTER THE WAR!

The same proved principles of pre-fabrication to provide all the conveniences of comfortable living without expensive frills assure equal success for the civilian counterpart of the Dallas Hut — the Texas Pre-Fab House. On the American scene, once the war is won, these houses will find countless applications, as low cost homes, workers' houses, summer cottages and housing for various industrial needs. Pre-Fabricated housing is the *big* construction news — and Texas Pre-Fabs are *proved* pre-fabricated houses!

Today, the Texas PRE-FAB is growing by leaps and bounds, and offers attractive POST-WAR possibilities. Already many applications for current and post-war dealerships are being received—from both civilians and military men. If you visualize the tremendous potentialities for Texas Pre-Fabricated Housing, and would like a profitable part in the future of this rapidly expanding industry, sign and mail the coupon below.

TEXAS PRE-FAB

(TEXAS PRE-FABRICATED HOUSE AND TENT COMPANY)

Dallas, Texas

Shoreham Bldg., Washington, D. C.

MAKERS OF DALLAS HUTS AND TEXAS PRE-FAB HOMES

TEXAS PRE-FABRICATED HOUSING COMPANY (Distribution Division)
Avery and Beckley Streets
Dallas 8, Texas

Gentlemen:

I'm definitely interested in the future of this industry, and would like more information regarding a possible dealership arrangement for post-war.

Name _____ Capacity _____

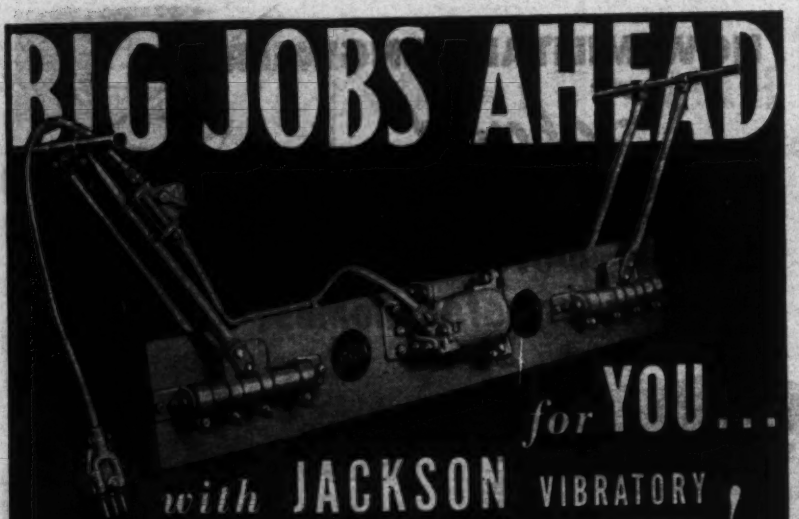
Current Address _____

Home Address _____
(if different from above)

City _____ State _____

Further Remarks _____

BIG JOBS AHEAD



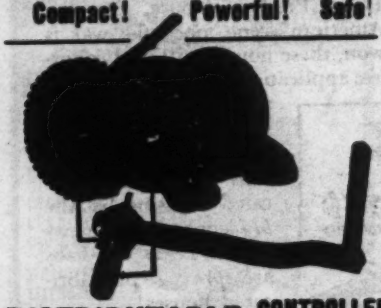
for YOU...

with JACKSON VIBRATORY HAND SCREED!

But before you tackle the big Post-War concrete contracting jobs, get acquainted with the wide scope in concrete surfacing operations offered by the JACKSON SC-4A vibratory hand screed. Its advantages include lightweight, uniform vibration and adaptability to reasonable widths of section. Gives complete puddling to low-water content concrete. Write for further details.

ELECTRIC TAMPER & EQUIPMENT CO.
LUDINGTON MICHIGAN

Compact! Powerful! Safe!



DISTRIBUTABLE CONTROLLED POWER

with Beebe ALL STEEL HAND HOIST
SEATTLE, U.S.A.

Money Has Been Saved on These Jobs

1200' assembled pipe (132 Tons) were lowered to bed of Mississippi at St. Paul with 9—5-Ton Beebes, three lines to each hoist through blocks.

Hudson River Bridge sidewalks were laid in sections with 32—5-Ton Beebes.

Longest wooden trusses in world were installed with ONE 5-Ton Beebe after power hoists proved impractical.

★

When raising, lowering, or placing costs by power are a serious problem, the answer is the right number of Beebe Bros. All Steel Hand Hoists MANNED IN UNISON. Available in 2, 5 and 15 Ton sizes. Sold through leading dealers in all trade centers. List of dealers sent upon request.

BEEBE BROS., 2720 6th Ave. S., Seattle 4, U. S.

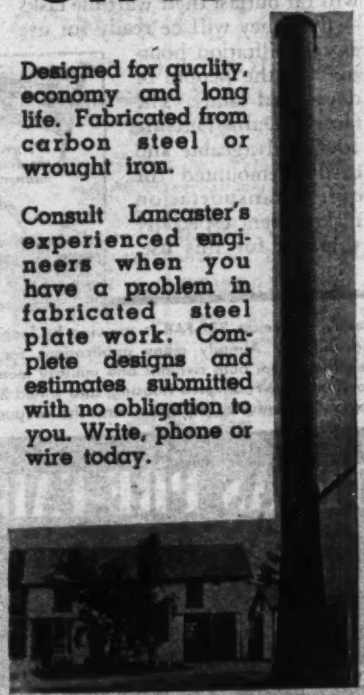
★

"THE STRONGEST GEARED POWER FOR ITS WEIGHT IN THE WORLD

STACKS

Designed for quality, economy and long life. Fabricated from carbon steel or wrought iron.

Consult Lancaster's experienced engineers when you have a problem in fabricated steel plate work. Complete designs and estimates submitted with no obligation to you. Write, phone or wire today.



LANCASTER IRON WORKS, INC.
Lancaster, Penna.

POSTWAR PROJECTS (Cont'd.)

N. Y., White Plains—PARK IMPROVEMENTS—Comrs. Westchester Co., White Plains, bldg. imprvs. at Saxon Woods, Crugers and Blue Mountain Parks. $[illegible] State Aid Planning Funds allotted.

N. C., Durham—BROADCASTING STATION—Durham Radio Corp., WDNC, 138 [illegible] Chapel St., FM radio broadcasting station. Over $25,000.

O., Salem—LIGHTING SYSTEM—City, [illegible] K. Wilson, dir. Pub. service, modernizing city lighting sys. $40,000. Financing not yet provided for.

Pa., Bradford—AIRPORT—City Council, Bradford, imprv. municipal airport, south of city. $250,000. S. Heffner, city engr.

R. I., Narragansett—WHARF, etc.—Town, J. F. Knowles, Town Hall, wharf, bldg. and waterway, Point Judith Harbor. Over $[illegible] 000. Engineer not appointed.

Tex., Houston—NATURAL GAS MAINS, etc.—D. H. Canterbury, 7135 Lawndale St., laying natural gas mains and facilities in residental area. Over $25,000.

Ont., Lindsay—LIGHTING SYSTEM—Municipality, lighting sys. in downtown section, $30,000.

Que., Quebec City—RADIO BROADCASTING SYSTEM—Province of Quebec, Quebec City, provincial radio broadcasting system, studios, etc., $400,000.

PLANS UNDERWAY

Ark., Fort Smith—FAIR GROUNDS—City [illegible] plans underway imprv. fair grounds, $100,000.

Ga., Macon—SWIMMING POOL—City, swimming pool, $75,000. W. Walker, city engr.

★**Ill., Cairo**—AIRPORT—City, City Hall, plans 20%, completed airport imprvs., paved 5,200 ft. runways, 150 ft. wide, blds., ramps, apron and connecting taxiways, administration bldg., large hangar and [illegible] hangars as needed, 3½ mi. north of here, $1,500,000. State Aeronautic Comn., Illinois Casualty Bldg., 5 and Capitol Sts., Springfield, consult. engrs.

Ill., Canton—AIRPORT—City, City Hall, airport, runways, hangar and administration bldg., 2¼ mi. northwest of here. $[illegible] 000. State Aeronautic Comn., Illinois Casualty Bldg., 5 and Capitol Sts., Springfield, consult. engrs.

Ill., Carbondale—AIRPORT—Southern Illinois Normal University, Class 3 airport, two 4,000 ft. diagonal concrete runways, one 3,500 ft. north-south concrete runway, one 4,000 ft. east west concrete runway, all 150 ft. wide, hangar etc. $475,000. State Aeronautic Comn., Illinois Casualty Bldg., Springfield, consult. engrs.

★**Ill., Centralia**—AIRPORT—City, class [illegible] airport, two 4,000 ft. and two 5,000 ft. runways, loading apron, administration bldg., 4 hangars, etc., 3 mi. southeast of here, $500,000. Bond election soon to purchase [illegible] acres land. State Aeronautic Comn., Illinois Casualty Bldg., 5 and Capitol Sts., Springfield, consult. engrs.

Ill., Centralia—LIGHTING SYSTEM, etc.—City, City Hall, whiteway-downtown lighting sys., standards and exten. of present sys., $100,000; making surveys, 178 acre park development outside city limits, east of city, north of State Route 161 and main entrance will be off Route 161, etc. $150,000, 3 year plan. H. B. Stover, City Hall, city engr.

Ill., Marion—SWIMMING POOL—City, City Hall, plans completed by W. Bintz, 1154 N. Washington St., Lansing, Mich., 70x140 ft., oval shaped swimming pool in city park, $35,000.

★**Ill., Mattoon**—AIRPORT—City, City Hall, three 3,500 ft. runways, 100 ft. wide, runway northeast, others southwest and northwest southeast, $564,000. Land rights not cleared, legal obstacles to be overcome and financing not yet provided for. State Aeronautic Comn., State Casualty Bldg., 5 and Capitol Sts., Springfield, consult. engrs.

Ill., Mt. Vernon—AIRPORT—City, City Hall, plans completed, Class 2 airport, three 100 ft. wide bituminous surfaced runways, 1 north-south runway, 2,800 ft., 1 east-west 3,400 ft. and other 3,500 ft. diagonal runway, small administration bldg., 4 mi. east of here, $400,000. State Aeronautic Comn., Illinois Casualty Bldg., 5 and Capitol Sts., Springfield, consult. engrs.

Ill., Shelbyville—AIRPORT—City, City Hall, three 1,500 ft. sod runways, 100 ft. wide, small administration bldg., 10 individual hangars, 2 mi. west of here. $[illegible] 000. State Aeronautic Comn., Illinois Casualty Bldg., 5 and Capitol Sts., Springfield, consult. engrs.

★**Ill., Springfield**—FAIR GROUNDS IMPROVEMENTS—State Dpt. Agriculture, Capitol Bldg., 11 barns, $385,000; concrete gutter and curbing along roads, concrete sidewalks, $98,000; landscaping $100,000; new 3 story, brick, concrete coliseum, $1,500,000, all at State Fair Grounds, C. Herrick Hammond, State Armory Bldg., state archt.

WAR PROJECTS (Cont'd.)

West Frankfort—AIRPORT, etc.—new airport, $200,000; plans 90% comp. approx. 60x120 ft. concrete swimming West Frankfort City Park, $27,000-R. E. Vineyard, Browning Bldg., engr.

Detroit—AQUARIUM—Zoological Comm., 8450 Ten Mile Rd., Royal Oak, underway 16x75x120 ft. rein.-con. with rein.-con. waterproof tanks, Geo. R. Thompson, city engr. CD ENR 4/1.

Detroit—BOAT HOUSE, etc.—Po. Dpt., Clinton and Rayner Sts., plans boat house and boat repair shop condemned boathouse on Belle Police Dpt. boats, $48,875. Site not decided. Geo. R. Thompson, City city engr.

Detroit—COMFORT STATIONS—Parks & Recreation, 725 Randolph St., 1% completed 11 20x40 ft., brick, park comfort station, with plumb-and heating equip., $230,000. Geo. R. city engr.

Detroit—PARK IMPROVEMENTS—Park Comn., 10 Mile Rd., Royal plans 55% completed 70x100 ft. rein.-artificial rock Seal Lion Exhibit, sur-by dry moat inclosing 5 ft. deep $25,000; plans underway 1 story, semi-concrete, steel bldg. for Australian Exhibit with outdoor inclosure of 1½ acres with artificial rock and log moat and pool, steel cages, etc., $40,000. R. Thompson, City Hall, city engr.

Detroit—PARKWAY DEVELOPMENT—Wayne Co. Park Comn., 2300 Tower, Bell Branch Parkway-Eliza Park to Northville-Parkway devel-3 comfort stations, 2 incinerators, and equip. bldgs., drives, bridges, grounds, drinking fountains, etc., at $1,250,000; Tonquish Creek Park Nankin Mills to Belleville Lake, 2 com-stations, maintenance and tool and bldg., concession bldg., foot bridges, drives, athletic grounds, agricultural and maintenance equip., at Bel-Nankin Mills vicinity, $510,000. Road-parks incl. comfort stations, fieldhouse, bldgs., equip., and storage bldgs., athletic grounds, agricultural sup-and maintenance bldgs., drinking $255,000. L. C. Smith, 2300 Barium Wayne Co. Road Comn., engr.

Detroit—SWIMMING POOL—Dpt. & Recreation, 725 Randolph St., plans completed 75x165 ft. rein.-con. swim-pool, incl. locker room, showers, puri-etc., at Jayne Field, $200,000; plans Baby Creek Park Development 14,000 lin. ft. c.i. watermain and 12,300 ft. concrete sidewalk, $733,000; plans 91x165 ft. Chandler Park swim-pool, locker rooms, etc., $190,000. R. Thompson, City Hall, city engr. CD ENR 4/1/43.

Detroit—STREET LIGHTING—Pub. Comn., 174 E. Atwater St., plans completed exten. street lighting sys., in resi-sections, $400,000; exten., addns. to thoroughfare street lighting sys., plans service line to Fairview Station in connection with electri-of station, $150,000; plans 6% com-brick, steel, Northeast Substation connection with pub. lighting sys., $297,-Geo. R. Thompson, City Hall, City

Fargus Falls—AIRPORT—City, M. Lein, clk., voted $60,500 bonds, Class municipal airport. Toltz, King & Day, Pioneer Bldg., St. Paul, engrs. CD ENR 1/10.

Park Rapids—AIRPORT—City, c/o Langguth, clk., City Hall, plans under-municipal airport, over $25,000. Wright MacGregor, 1188 Nicollet Ave., Minne-consult. engrs. CD 1/26—ENR 1/10.

Nebraska—TRANSMISSION LINES—York Rural P.P. Dist., York, plans under-transmission lines, $200,000. REA ap-allotment. Henningson Engineering Standard Oil Bldg., Omaha, consult.

New York—PARKS, etc.—Dpt. P. Wks., Offices Bldg., Albany, Zone 1, plans Proj. CON-23, completion of golf house and golf course at James Baird Park, $37,000. Jones, Cox, Dreyer & 20 Vesey St., New York, Zone 7, CON-14, development of park area James Baird State Park, $100,000; CON-boat basin and dock, $50,000; CON-26, house and swimming pool, $95,000 both Margaret Lewis Norris State Park. Skid-Owings & Merrill, 5 E. 57 St., New Zone 22, archts. All for Taconic Park Comn., Conservation Dpt.

New York—PARKING FIELD, etc.—Dpt. Wks., State Office Bldg., Albany, Zone 1, preliminary plans underway CON-45, Over-Parking Field at East bathhouse, CON-44, short beach boat basin enlarge west Overlook Parking and boardwalk connection, $75,000, Allman & Combs, 681 Fifth Ave., New York, Zone 22, consult. engrs.; CON-46, 3 bus sta-and shelters, $30,000. Wm. E. Hau-

"Conservation Welding" Saves Metal, Money and Time

Amsco Welding Products are used exclusively for the reclamation, hard-surfacing and repair of ferrous equipment parts.

They are widely employed for the restoration of worn construction equipment parts, whether manganese steel or carbon steel, with resultant savings in maintenance expense and reduction of lost operating time. In many cases the welded parts have a service life comparable to new ones, at a much lower cost. Amsco conservation welding has been of especial value since 1941 when *General Delay* seems to have taken command of the procurement of replacement parts.

Applications, to mention just a few, include the restoration of dipper teeth; dredge pump shells; crusher parts; and crawler sprockets and shoes.

A-300 shows a worn dipper tooth and a similar one rebuilt by welding.

A cast diamond-section dipper tooth repointer bar, torch-cut to the correct width, was tacked on and the grooves were filled in with nickel-manganese steel welding rod. Dipper teeth are renewed in this way at less than the cost of new ones.

A-178 shows (right and left) worn and hard-surfaced concrete block machine tampers. The customer standardized on Amsco No. 459 for hard-facing after comparative tests showed 20% longer wear than any other metal.

A-212. A worn crusher jaw and the same after the ribs were rebuilt by tacking on Amsco filler bars and filling in with Amsco nickel-manganese steel welding rod. A coating of Amsco No. 459 Hard-Facing Rod was applied at the top of each serration.

Ask for Bulletin 941-W on Amsco Welding Products.

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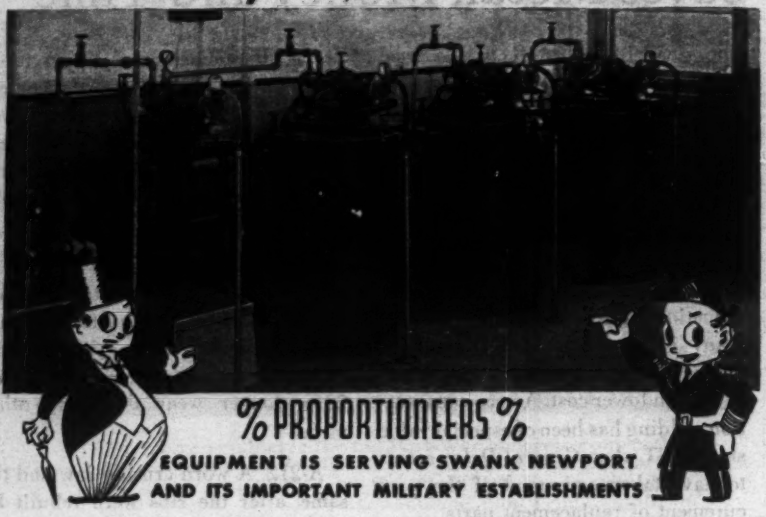
AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Illinois
FOUNDRIES AT CHICAGO HEIGHTS, ILL.; NEW CASTLE, DEL.; DENVER, COLO.; OAKLAND, CALIF.; LOS ANGELES, CALIF.; ST. LOUIS, MO.
OFFICES IN PRINCIPAL CITIES

AMERICAN Brake Shoe COMPANY

..at Newport, Rhode Island



%PROPORTIONEERS%
EQUIPMENT IS SERVING SWANK NEWPORT
AND ITS IMPORTANT MILITARY ESTABLISHMENTS

Four hydraulically operated manually controlled %Proportioneers% Chem-O-Feeders, illustrated at left, are installed in the chemical feed room at the new Lawton's Valley Plant of the City of Newport where they are feeding aqua ammonia for taste and odor control with conspicuous success. The 26° BE aqua ammonia is forced by compressed air from a 500 gallon underground storage tank into three individual fume-proof dilution tanks, shown at left, where it is diluted with water, 9 to 1 in one of the tanks, and 18 to 1 in the others. One Chem-O-Feeder is used for pre-ammoniation and two for post-ammoniation of the discharge from 1400 and 2800 gallon per minute pumps. The fourth feeder will soon be in use feeding Calgon to the plant effluent for corrosion control.

%Proportioneers% is prepared to handle your postwar ammoniation and Calgon feeding problems, whether your plant is smaller or larger than the Lawton's Valley Plant at Newport which is now operating at four and a half million gallons per day. Write today for our recommendations.

%PROPORTIONEERS, INC.%
Chemical Feeder Headquarters
92 CODDING ST., PROVIDENCE 1, R. I.

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LOAD TESTS—TEST PITS

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...TWAR PROJECTS (Cont'd.)

...rd, 250 Fifth Ave., New York, Zone 1, ...ect. All at Jones Beach State Park, for ...g Island State Park Comn., Conserva... Dpt.

...New York—PARK IMPROVEMENTS— ...r. P. Wks., State Office Bldg., Albany, ...e 1, preliminary plans underway, CON-33, ...ge, walks, jetties, addnl. parking area, ...each area, Hecksher State Park, ...,000; CON-46, water supply and sewage ...osal sys., at Hither Hills State Park, ...,000; CON-49, fencing, walks and exten. ...water supply and sewage disposal sys., ...Sunken Meadows State Park, $25,000, ...man & Combs, 681 5 Ave., New York, ...e 22, consult. engrs. CON-47, new board... ...k at Sunken Meadows State Park, $50,000, ...mes & Combs, 681 5 Ave., New York, ...e 22, archts. All for Long Island State ...k Comn., Conservation Dpt.

...N. Y., New York—TRACK REMOVAL, etc. ...President Manhattan Boro, W. D. Binger, ...r. Boro Wks., D. G. Edwards, ch. engr. ...r. Hys. and Sewers. Municipal Bldg., ...e 11, plans completed track removal and ...ement restoration at Bway., 42 to 71 ...Amsterdam Ave., 65 to 71 Sts., (PMS-3), ...,000. State Aid Planning Funds allotted.

...N. Y., New York—TRACK REMOVAL, etc. ...President Manhattan Boro, W. D. Binger, ...r. Boro Wks., D. G. Edwards, ch. engr. ...r. Hys. & Sewers, Municipal Bldg., Zone ... plans underway track removal and pave... ...t restoration at Columbus Circle, 8th ...e. to Bway., 59 St., Bway to 10th Ave., ...(PMS-7). $65,000. State Aid Planning Funds ...otted.

...N. Y., New York—TRACK REMOVAL, ...etc.—President Manhattan Boro, W. D. ...nger, comr. Boro Wks., D. G. Edwards, ... engr. Bur. Hys. & Sewers, Municipal ...dg. Zone 7, plans underway track re... ...val and pavement restoration Broadway, ...7 to 71 St. (PMS-2), $200,000; 145 St., ...way, to Harlem River, 155 St., Amsterdam ...e, to Harlem River (PMS-5), $162,000; 135 ... 1 Ave. to Harlem River (PMS-6), ...,000; 125 St., 3 to 12 Aves., 12 Ave. ...5 St. to St. Clair Place, Bway., 125 to 107 ...(PMS-1), $200,000; Amsterdam Ave., 125 ...165 Sts. (PMS-4), $200,000. State Aid ...nning Funds allotted.

...N. Y., New York—TUNNEL EXTENSION ...President Manhattan Boro, W. D. Binger, ...r. Boro Wks., D. G. Edwards, ch. engr. ...r. Hys. & Sewers, Municipal Bldg., Zone ... plans underway (tunnel exten., Park Ave. ...to 22 St. (PMS-8), $165,000. State Aid ...nning Funds allotted. CD 1/28—ENR ...10.

...N. D., Mandan—SWIMMING POOL—City, ...E. Arthur, aud., swimming pool, $30,000. ...rts & McDonnell, 107 W. Linwood Blvd., ...nsas City, Mo., consult. engr.

...O., Lorain—RUNWAYS—City, G. H. Van ...agner, mayor, City Hall, purchase present ...port site and construct new runways, ...,000. L. Goodell, City Hall, city engr. ...1/28—ENR 8/10.

...S. C., Charleston—AIRPORT—City, imprv. ...d extending airport, incl. administration ...g. $100,000. B. M. Thompson, City Hall, ...y engr.

...Texas—LIVESTOCK FENCE—Livestock ...nitary Comn. of Texas, W. T. Waggoner ...dg., Fort Worth, plans 75% completed 500 ...le livestock fence between Brownsville and ...ville River, Val Verde Co. Over $100,000.

...Tex., Dallas—RUNWAY, HANGAR, etc.— ...W. Caruth, Jr., et al, 1215 Main St., ...e 2,400 ft. runway and exten. 2 others, ...angars, service facilities and shop, soil ...abilization and asphalt topping, etc. Over ...,000. H. Bartholomew, 317 N. 11 St., ...Louis, Mo., consult. engr.

...Vt., Burlington—AIRPORT EXTEN... ...SIONS, etc.—City, airport exten., $375,000; ...rks and playgrounds, $190,000; electric ...ht and power imprvs., exten., $250,000, ...ancing not yet provided for. Geo. C. ...anley, city engr.

...Wis., Antigo—AIRPORT—City, S. B. ...yrne, clk., airport, $100,000. H. Olk, city ...gr.

...Wis., West Allis—PARKS—City, 7525 W. ...enfield Ave., 2 14, plans parks. $80,000. ...Burbach, city engr.

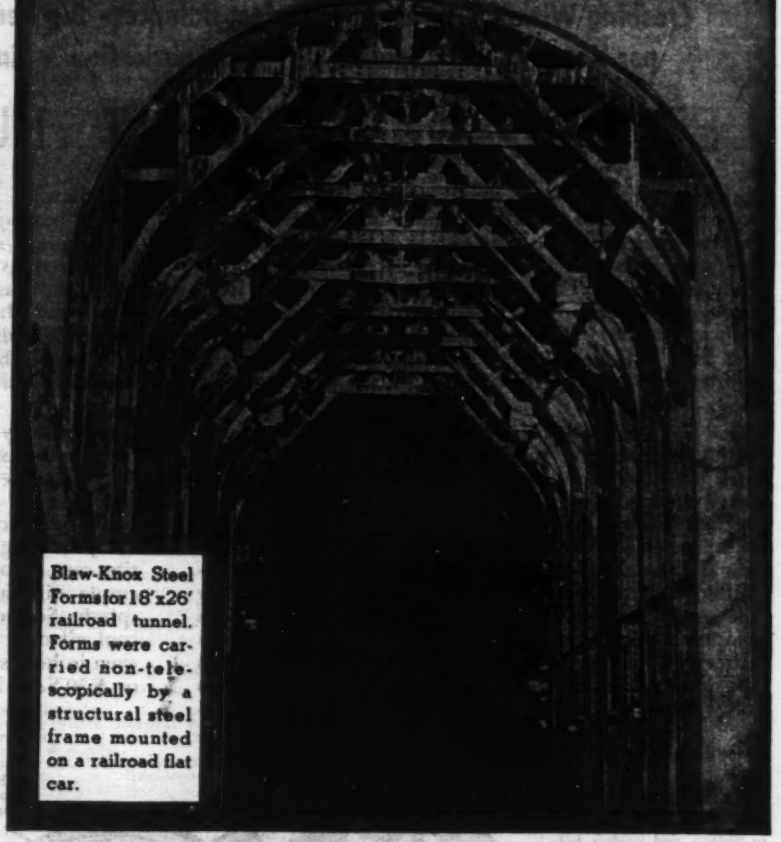
...B. C., Oak Bay—SWIMMING POOL—Mu...cipality, swimming pool, $100,000. A. S. G. ...ngrave, Town Hall, engr.

...N. B., Saint John—ELECTRIFICATION ...—Province of New Brunswick, Frederic..., complete electrification of Province, ex...sion of Grand Lake Power plant, develop...ent of Petitcodiac Tidal power project. ...,000. New Brunswick Power Com., ...nt John, engr.

...Ont., Long Branch (Postal Dist. Toronto)— ...IRPORT—Municipality, airport, Lakeshore ...ea., $150,000. Dpt. Transport, Ottawa, in ...sociation with Civic Authorities, engr.

...Ont., Niagara Falls—AIRPORT—City, J. ... Lasson, pres., c/o Local Chamber of ...mmerce, airport to serve Niagara Falls, ...nland, St. Catherines and Chippawa. ...,000-$300,000. W. S. Orr, City Hall, ...iagara Falls, engr.

BLAW-KNOX STEEL FORMS



Blaw-Knox Steel Forms for 18'x26' railroad tunnel. Forms were carried non-telescopically by a structural steel frame mounted on a railroad flat car.

For a Better Job in Less Time

The design and fabrication of heavy forms is no "side line" at Blaw-Knox. An entirely separate department of Form Engineers has devoted years to this specialized business with many notable successes to prove their ability. From past experience they have learned how to plan a concrete construction job so that the work will proceed quickly, smoothly and at the lowest possible cost.

Current construction of a sufficiently urgent nature can now be served, and long range planning for future contracts can be aided by Blaw-Knox engineers.

BLAW-KNOX STEEL FORMS are used for the construction of
TUNNELS WALLS SEWERS DAMS BRIDGES PIERS
CONDUITS ROADS SEWAGE DISPOSAL PLANTS
and other varieties of concrete construction

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WILL IT HAVE THESE FEATURES?

Crushing Without Abrasion • Perfect Balance • Big Reduction Ratio • Large Capacity per Horsepower • Sealed, Dirt Free Lubrication • Simple, Positive Safety Device

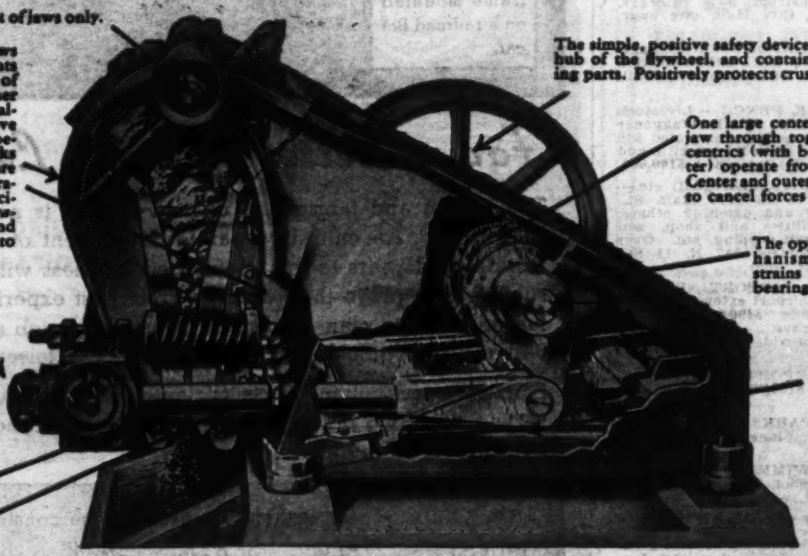
LET'S TALK ABOUT LUBRICATIO

Lubrication of ordinary jaw crushers is usually attempted by one of several methods, such as grease, ring oiling or oil circulated by pump, etc. Water jackets are frequently necessary to keep the larger bearings cool enough to run. These ordinary machines suffer from two grave defects. The first is small bearing area, insufficient to carry the severe loads imposed. The resulting high pressures in the bearing break through the lubrication film, and thus permit "metal to metal" contact between shaft and bearing. Good lubrication such a bearing is impossible, and water cooling is o a temporary relief, not a cure. Second, practically such bearings are exposed to showers of gritty, ab sive dust, that easily penetrate to the oily working s faces, and thus form a rapid "grinding" compou With the combination of extremely high bearing pr sures and "abrasive" lubrication, is it any wonder t bearings wear out so quickly?

Now see how the entirely different Kue-Ken* design first eliminates the root of all bearing troubles, and then provides abundant, clean lubrication. Each of the two movable jaws travels only half as much as the ordinary single jaw. The shaft eccentrics are at 180° and in perfect balance. They are made with exceptionally long strokes. These long strokes are transmitted and reduced through oil bathed toggles to give the requisite powerful short strokes to each jaw. This simple method gives five times more leverage than other designs, and consequently imposes only one-fifth the load and pressures on the shaft bearings. With the extremely large bearings used in Kue-Ken crushe the bearing pressures per square inch are actually ev less than one-fifth!

Now refer to the cutaway view below and see ho every moving part is shielded in the sealed and du tite case, protected against grit and wear. Note t ample oil bath into which all toggles and pitma splash. See how the oil pump cascades gallons of cle cool oil over the shaft and bearings. Real lubricatio even in hottest climates, with light thin oil—about # or #30 SAE. No wonder Kue-Ken bearings last so lon

* Pronounced Q-KEN


Hinge pins support weight of jaws only.
Two long symmetrical jaws hinged at the top. All points travel downward in an arc of circle as they move together in unison and perfect balance. As there is no relative up or down movement between the jaw plates, rocks are crushed by pure pressure without rubbing or abrasion. This exclusive principle of *crushing without abrasion* uses less power and makes jaw plates last five to ten times longer.
Accessible nuts are positively located on each side rod, locked in one position to prevent unequal adjustment. To change jaw opening, merely remove nuts and add spacers (furnished in various thicknesses), and replace nuts to locked position.
The exclusive KUE-KEN design of rear jaw plate lugs, which permits jaw plates to be worn entirely away without wear on jaw stock itself.
The simple, positive safety device is not visible. It is in t hub of the flywheel, and contains no shearing or be ing parts. Positively protects crusher from tramp iron,
One large center eccentric operates jaw through toggles, and two outer centrics (with bearing area equal to o ter) operate front jaw through togg Center and outer eccentrics are 180° ap to cancel forces and balance mechan
The opposed and balanced hanism eliminates crushi strains on the shaft and bearings.
In *addition* to the spl lubrication, cool oil pumped from the ba dust tight, sealed oil r ervoir through an in gral filter and then t the shaft bearings a toggles, giving posi lubrication. A pressu switch automatica stops the crusher if supply should fail.

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WATER SUPPLY

PROPOSED WORK

Mass., Brooks—Municipality, water supply ... easterly sect. town. $15,000.

Calif., Napa—City Council, City Hall, received bids Aug. 15, gravity section concrete ... approx. 50 ft. high. CD 8/18—ENR ... under LB.

Me., South Portland (br. Portland)—... Housing Auth., NHA, 24 School St., ... Mass., laying approx. 1,000 lin. ... 8 in. watermain, valves, accessories, ap... Broadmoor Park and Peary Village. ... FWA.

Mass., Braintree—Town, Water Dpt., 795 ... Washington St., making plans 11,600 ft. ... watermain, State Hy., West St. and ... 121, $50,000. Weston & Sampson, 14 ... St., Boston, engrs. CD 4/17—ENR ...

Mich., Toll City—Bd. P. Wks., W. Werner, ... and chn., N. Beumel clk., retained ... Burden, consult. engr., Cannelton, to ... surveys and recommendations water ... tank, watermain extens. CD 8/21—

O., Cleveland—City, F. Foy, purch. agt., ... City Hall, elevated steel water storage ... in Brecksville provided by B. F. Good... Co., Akron, construct laboratory bldg. ... $40,000; 75 m.g. daily cap. intake ... filtration plant and pump station, ... making plans 200 x 500 ft., 40 ft. ... 25 m.g. storage reservoir, Nottingham ... $1,500,000; 25 m.g. cap. Basin 2, ... Reservoir, $500,000. G. M. Hamlin, ... City Hall, engr.

O., Cleveland—City, F. Foy, purch. agt., ... Hall, 13,000 ft. 33 in. rein.-con. water... Tradesman, Brookpark and Bellaire ... G. H. Hamlin, City Hall, engr.

O., Newark—City, P. F. Green, dir. Pub. ... City Hall, improv. water filtration ... $150,000; installing coal handling equip. ... Bond sale underway. C. H. Wells, ... Hall, city engr.

O., Salem—City, F. K. Wilson, serv. dir., ... Hall, plans completed 5 m.g. water ... reservoir. $110,000. F. S. Burck... City Hall, city engr. CD 8/23—ENR ...

S. C., Winnsboro—City, F. E. Lyles, chn. ... P. Wks., preparing plans WW, SC 33... Harwood Beebe, P. O. Box 239, ... engrs.

T. H., Honolulu—Bd. Water Supply, ... City and County of Honolulu, improv. ... Ind. 67,300 lin. ft. 10- to 42-in. c.i. ... mains, valves, hydrants, appurtenances, ... sta., 3 m.g. reservoir, 2,300 lin. ft. ... ft. tunnel, TH 51-123-N. $2,650,000. ...

Va., Pulaski—Municipality, intake pipe, ... rein.-con. wells. $30,000. G. G. Reid, ... Edmund Ave., Toronto, engr.

Ont., St. Thomas—Westminster Twp., St. ... watermain extens., installing fire ... $35,000. F. Bell, County Bldg., ...

Ont., Simcoe—Municipality, addnl. water... $30,000. International Water Supply ... c/o W. D. Stalker, P. U. C., Simcoe, ...

Que., Montreal—Municipality, J. A. Mon..., city clk., addnl. filtration units in... plant to 200,000 gal. daily. $150,000. ... Gibson, City Hall, engr.

BIDS ASKED

Bids Asked Ahead September 13

Va., Williamsburg—City, filtration plant ... Walker's Dam, Va. 44-275. $75,000. FWA. ... & Wilson, 307 Peoples Natl. Bank ... Lynchburg, consult. engrs. CD 8/5—... 8/11.

Bids Asked September 18

Ont., St. Prince George—Secy. Dpt. Transport. ... Ont., water supply for airport. $25,... Plans deposit $10.

CONTRACTS AWARDED

N. J., Stanhope—Boro, reservoir addn., to ... Bros., Inc., Main St., $15,975. CD ... ENR 8/19.

Pa., Latrobe—Municipal Management Co., ... Ikell, West Dist. Rep. in charge, 1st ... Bank Bldg., replacing wooden main ... approx. 23,000 ft. 24 in. c.i. watermain ... furnishes material), following site ... main from Trout Run Reservoir to ... plant near here, to H. B. Alexander ..., 2 and Vaughn Sts., Harrisburg, $112,... C. C. Wedesmeyer, Latrobe, engr. In ... for Boro. CD 4/19—ENR 4/27, under ... Run.

Symbols and Abbreviations Include

† Federal Government
★ Project of $500,000 or over
ENR Engineering News-Record
CD Engineering News-Record Construction Daily
A-E-M Architect-Engineer-Management type of contract

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger; water supply, earthwork, waterworks, $15,000; other public works $25,000; industrial buildings, $40,000; other buildings, $150,000.

Classes of Construction

(Named in order of Listing)

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings
Unclassified

Stages Reported

PROPOSED: (except Streets & Roads); BIDS ASKED (new announcements only. For full calendar, see also preceding issues of ENR);

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage

Dates shown are of issue in which last previous report was published.

R. I., Scituate—City of Providence, Bd. Contr. & Supply, City Hall, Providence, Scituate Reservoir, main dam, top grading, seeding, to General Engineering & Contracting Co., 33 Bway., Providence. $32,395.

†Tex., Dalhart—U. S. Eng., 416 Wright Bldg., Tulsa, 3, Okla., addnl. water facilities, Sol. 34-66-45-4, to Ditmars-Dickmann Constr. Co., Muskogee, Okla., $37,773. CD 8/15—ENR 8/17.

Tex., Houston—Water well development, chlorinators and ammoniators, etc. for 4 wells, to Wallace & Tiernan Co., 3515 Fannin St., $24,197. CD 7/31—ENR 8/2.

†Utah, Orem—Town, B. M. Jolley, mayor, 45,460 lin. ft. 2- to 4-in. c.i. watermains, to Wheeler & Tempest, 22½ E. 1 So. St., Salt Lake City, $58,415. Bids 8/24. CD 8/14—ENR 7/20, under Sewers.

†Wash., Manchester—Yards & Docks, Navy Dpt., 13 St. and Constitution Ave. N.W., Wash. 25, D. C., emergency water supply, Naval Station, NOY 16513, to N. C. Jannsen Drilling Co., P. O. Box 3155, Seattle.

Ont., Rodney—Village, H. W. Thomson, recve, supply main West Lorne to Rodney, to Carroll-Sharp Const. Ltd., 43 Scott St., Toronto, $19,000. CD 7/8—ENR 7/13.

SEWERS, WASTE DISPOSAL

PROPOSED WORK

†La., New Orleans—Sewerage & Water Bd., 526 Carondelet St., sewage disposal unit at housing, Gentilly Rd. and Reynes St. $32,300. FWA allot.

Miss., Woodville—Town, W. J. Stockett, mayor, sewerage sys. $106,000. Plans revised application to FWA. M. W. Brown, McComb, engr. CD 13/14—ENR 12/16.

N. C., Burlington—City, E. B. Horner, mayor, rejected bids Aug. 21, 5 mi. 8 and 10 in. sewer extens. $37,000. Will readvertise. Linberg Engrg., City Hall, engrs. CD 8/28, under LB—ENR 8/10.

†N. C., Carolina Beach—Town, repairing, rehabilitating sewers, pump stations, streets, sidewalks, N.C. 31-304-N. $33,300. FWA.

O., Cleveland—City, E. J. Crown, dir. Pub. Utilities, City Hall, constructing 4 sewage pump stations, regulators. $100,000. E. C. Richardson, 513 City Hall, city engr.

Tex., Baytown—General Tire & Rubber Co., Baytown, waste disposal plant, $100,000.

Tex., Palestine—City, plans $30,000 bond election underground drainage sys. for airfield. J. B. Early, city engr. E. L. Killingsworth, 2220 N. 5 St., Waco, engr.

†Va., Arlington—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., storm water and sub-soil drainage sys. at Arlington Hospital, Va. 44-130. FWA.

Wash., Seattle—City, County-City Bldg., Zone 4, sewerage sys. serving 36 block area between W. Kanyon and Cloverdale Sts., Fauntleroy Ave. to 37 Ave. S.W. $59,076. C. L. Wartelle, City Hall, city engr.

★Puerto Rico, San Juan—Div. Pub. Wks. of City Government, submitted plans and specifications to Planning Board, for sanitary sewerage and pluvial system for Santurce serving Avenida Eduardo Conde, Taft Sts. along Atlantic Ocean seaboard and Corozos Laguna. $1,700,000.

Alta., Brooks—Municipality, sewerage sys. to easterly sect. town. $35,000.

B. C., Vancouver—Vancouver & District Joint Sewage & Drainage Bd., 50 ft. artes. to storm water outfall into English Bay. $30,000.

N. B., Sackville—Municipality, H. A. Beale, mayor, sewerage sys., West End. $35,000.

Ont., Islington—Etobicoke Twp., S. Barratt, clk., Islington, storm sewers. $66,033.

Ont., London—City, K. G. Crawford, mayor, improv. West End sewage disposal plant. $200,000. W. W. Veitch, c/o owner, engr.

Ont., London—30 in. interceptor sewer in Victoria St. $45,000. Wm. Veitch, City Hall, engr.

Ont., Peterboro—Municipality, modernizing sewage disposal plant, diverting present outlet of septic tanks across river from Burnham's Point to MacDonald's point. $35,000.

BIDS ASKED

Bids Asked September 13

Mich., Grosse Pointe Woods (br. Detroit)—P. F. Allard, village clk., brick, steel, concrete storm water pump. station for storm water pump. equip., and three 200 hp. motors and one 400 hp. motor, other electrical equip. Plans deposit $15. Pate & Hirn, 523 Michigan Bldg., Detroit, engrs. CD 7/28.

Bids Asked October 5

Pa., Manheim—Boro Manheim Auth., J. C. Gingrich, secy., Boro Hall, secondary settling tanks, completing sprinkler filter at sewage treatment works, bridge appurtenances. Plans deposit $20. R. H. Gregg Estate, Engineers, 232 N. 3 St., Harrisburg, and Albright & Friel, Inc., 1520 Locust St., Phila., Zone 2, consult engrs., adv. ENR 9/14.

LOW BIDDERS

†N. Y., Canandaigua—Veterans Admin., Vermont Ave., between H and I Sts. N.W., Wash. 25, D. C., Aug. 22, sewage disposal plant at Veterans Hospital, from Interboro Co., 109 E. 19 St., New York, Zone 16, $110,420. CD 7/24—ENR 7/27.

Pa., Titusville—City, G. Becker, city clk., City Bldg., Aug. 21, 25 ton d.c. prehearth type incinerator plant, from Pittsburgh-Des Moines Steel Co., Neville Island, Pittsburgh, $94,780. CD 7/14—ENR 7/27.

†Wash., Moses Lake—Federal Works Agency, Alaska Bldg., Seattle, Zone 4, Aug. 29, lift station and treatment plant, Wash. 45-350-F, from Chisholm & Eiford, 1726 State St., Bellingham, $69,000. G. D. Hall, Larson Bldg., Yakima, engr. CD 8/17.

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SEWERS, WASTE DISPOSAL, etc. (Cont'd.)

CONTRACTS AWARDED

†Mich., Royal Oak—Royal Oak Twp., 2[illegible] John R St., sewer in Eight Mile Rd., Mich. 26-30S-N. to Haines & Haines, Elkhart, Ind. $71,046. FWA. CD 1/4—ENR 1/6.

Pa., West Leechburg—Boro Council, K. [illegible] Walheim, secy., P. O. Box 465, 1 mi. 24 [illegible] concrete sewer pipe and 1 mi. 5 in. bituminous surfacing various streets, to Burns Constr. Co., 5 St., New Kensington. Est. $25,000. R. F. Wilts, Jeannette, engr.

†Tex., Harlingen—U. S. Eng., 25 St. and Avenue F, Galveston, sanitary sewer extens. to Dodds & Wedegartner, 382 N. Bowie St., San Benito, $28,000.

Tex., Houston—Storm sewers, laterals in 10 blks. Aurora St., to Thos. Bate & Son, 1107 Girard St., $161,945; storm sewers in Pecan Park, to Jno. Heffernan, Jr., 1[illegible] Charleston Rd., $95,083, est. $110,000. G. L. Fugate, city engr.

†Utah, Orem City—Town, B. M. Jolley, mayor, sanitary sewerage sys., to Victor Newman Constr. Co., McIntyre Bldg., Salt Lake City, $162,017. FWA. Bids 8/24. CD 8/18—ENR 7/20.

BRIDGES

PROPOSED WORK

†Alaska, Ketchikan — Pub. Rds. Admin., Juneau, bids soon 120 ft. steel truss span on rein.-con. superstructure with concrete deck across Ketchika Creek, Stedman St., $88,000.

Ont., Williamstown—Charlottenburgh Twp., c/o L. C. Kennedy, clk., Township Hall, Williamstown, bridge. H. J. Walker, Cornwall, engr.

BIDS ASKED

Bids Asked September 19

Indiana—State Hy. Comn., S. C. Hadden, chn., Indianapolis, raising present steel girder superstructure, railroad tracks, paving approaches N. Y. Central Ry. structure, 3 spans, 53 ft. long, Fort Wayne, Allen Co. 2 span, 40 ft. continuous rein.-con. slab bridge and paving approaches over Conner Branch, State Rd., 31, s.e. of Walesboro, Bartholomew Co.; new concrete floor on bridge over west fork of White River Overflow, State Rd. 31 north of Indianapolis, Marion Co.; rip rap about piers and abutments on 3 bridges over west fork of White River overflow, State Rds. 54 and 57, Greene Co. Plans deposit $1.75. R. Bower, ch. engr.

LOW BIDDERS

Louisiana—State Dpt. Hys., Baton Rouge, Aug. 23, reconstructing 8 bridges, approaches, Bienville Parish, from Austin Bridge Co., 1813 Clarence St., Dallas, Tex., $192,741. CD 8/7—ENR 8/10.

O., Canton—City, bridge over East Creek, 19 St. N.E., from Garaux Bros. Co., 405 [illegible] St. S.W., $46,841, Est. $44,789.

Wash., Tacoma—City, City Hall, Aug. 2[illegible] bridge on E. 30 St., from MacRae Bros., 2711 4 Ave. S., Seattle, $36,973.

CONTRACTS AWARDED

Alabama—State Hy. Dpt., Montgomery, [illegible] bridges on Livingston-York Rd., Sumter Co., to Forcum-James Co., Dyersburg, Tenn., $185,434; bridges on York-Mississippi State Line Rd., Sumter Co., to T. H. Pearce Co., Columbus, Ga., $94,216.

O., Canton—A. W. Fabry, ser. Dir., City Hall, two 28 ft. arch bridge, concrete spandrels and parapet walls and bridge over 11 St. S.E., to Garaux Bros. Co., 415 9 St. S.W., $46,000 and $89,000 respectively, est. $51,000 and $96,194 respectively. J. A. Shisler City Hall, city engr.

Que., St. Lin — Municipality, c/o C. E. Pauze, clk., bridge over Assomption River, to E. Lafortune, 175 Ste. Angelique St., Joliette. Est $25,000. Bids 6/26. CD 6/[illegible] —ENR 6/22.

STREETS AND ROADS

PROPOSED WORK

Puerto Rico, Santurce—Insular Dpt. Interior, San Juan plans imprv. sidewalks, Fernandez Juncos Ave. $41,800.

BIDS ASKED

Bids Asked September 12

Indiana—State Hy. Comn., S. C. Hadden, chn., Indianapolis, bituminous resurfacing 2.52 mi. State Rds. 31 and 44, Franklin-Greenfield Hy. Dist., Johnson Co., Contr. 2544. Plans deposit $2.50. R. Bower, ch. engr.

N. J., Caldwell—Boro of North Caldwell, Municipal Bldg., North Caldwell, Type A or T surface on modified penetration macadam intermediate course and macadam fdn. paving, Grandview Ave., North Caldwell. E. Coures, Municipal Bldg., North Caldwell, engr.

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STREETS & ROADS (Bids Asked, Cont'd.)

N. Y., Brooklyn — President Brooklyn Boro, Boro Hall, Zone 2, grading, curbing, flagging where necessary, permanent asphalt on 6 in. concrete paving, '16 Ave., 83 and E. 40 Sts.

Pennsylvania—State Dpt. Hys., Harrisburg, bituminous on native stone or crushed aggregate paving 0.82 mi. and 3 concrete arches paralleling Mahoning Creek in Flood Control Reservoir area, Rural Route 32111, Indiana Co. Bids 7/25 and 8/15 rejected, CD 7/27 and 8/17—ENR 8/3 and 8/24 under LB; concrete curbing 0.69 mi. and bituminous existing pavement resurfacing, U.S. Route 122, Mount Carmel Borough, Northumberland Co.

★**Ohio**—State Hy. Dpt., Columbus, grading, drainage structures, rein.-con. paving, rein.-con. box culvert over Candy Run, 0.407 mi. Sect. H of SH 5, US 23, Scioto Co.; grading, drainage structures, bituminous on waterbound macadam surface treating, constructing continuous concrete slab bridge over Millers Creek, 0.463 mi. Sect. C of SH 185, Warren Co.; bituminous treating 30.06 mi. Sects. State Hys. 19, 467 and 959, Butler and Hamilton Counties, $60,963; bituminous macadam surfacing 2.002 mi. Sects. A, B and Cumberland, of SH 688, Guernsey and Noble Counties, $41,200; installing roadway drainage 7.929 mi. Sects. S and A of SH 290 and 886, Lorain Co., $105,000; concrete patching pavement 24.016 mi. Sects. T, S, R, Q, B, A of SH 422, US 24, Paulding and Defiance Counties, $65,800; cold-mixed, cold-laid asphaltic concrete resurfacing 1.237 mi. Sect. Niles of SH 328 and 150, Trumbull Co., $26,500; asphaltic concrete resurfacing 1.079 mi. Sects. Lima and C of SH 22, US 25, Allen Co., $18,560; 2.674 mi. Sects. H and Ashtabula of SH 350 and 563, and Sects. J and Jefferson of SH 151 and 2, Ashtabula Co., $48,530; 0.822 mi. Sect. Urbana of SH 190, US 36, Champaign Co., $18,070; 0.987 mi. Sects. Wilmington and B of SH 254,175 and 248, Clinton Co., $25,200; 2.033 mi. Sects. Bexley and Columbus of SH 1 and 49, US 33 and 40, $68,430; 0.894 mi. Sect. Columbus of SH 1, US 40, $26,500; 1.288 mi. Sect. Columbus of SH 4, US 23, $31,930, all foregoing in Franklin Co.; 0.732 mi. Sects. Cambridge and Cumberland of SH 1, 353, 348, 484, US 22, 40 and 21, Guernsey Co., $21,330; 1.099 mi. Sects. M and Mariemont of SH 8, US 50, Hamilton Co., $22,800; 0.726 mi. Sect. Monroeville of SH 764, Huron Co., $11,120; 5.345 mi. Sects. O, P, B-2 and E of SH 344 and 347, Muskingum Co., $102,300; 2.443 mi. Sects. Somerset, New Lexington and Junction City of SH Nos. 19,356, 357, 854, 355 and 854, Perry Co., $41,800; 0.745 mi. Sect. Mansfield of SH 114, Richland Co., $12,430; 1.6 mi. Sects. Bryan and B of SH 305, 306, and 307, US 6 and 127, Williams Co., $34,330.

Bids Asked September 15

Kansas — State Hy Dpt., Ellsworth, resurfacing material 10.142 mi. P. 2638, Clay Co.; 12.288 mi. P. 2627, 11.523 mi. P. 2639, both Dickinson Co.; 5.671 mi. P. 2630, 5.2 mi. P. 2929, 13.931 mi. P. 2629, 12.255 mi. P. 2628, 8 mi. P. 605, all foregoing in Ellsworth Co.; 15.431 mi. P. 2631, Jewel Co.; 12.04 mi. P. 2632, Lincoln Co., 3.1 mi. P. 2612, McPherson Co.; 5.4 mi. P. 2634, Marion Co.; 7.96 mi. P. 2640, Morris Co. R. C. Keeling, Topeka, engr.

Kentucky—Dpt. Hys., Frankfort, imprv. 0.1 mi., Frankfort-Shelbyville Rd., SN-SP-37-145, Franklin Co.

Minnesota—State Hy. Dpt., St. Paul, grading 1 mi. between 1 mi. and 1.4 mi. north of Weaver, Wabasha Co., 118,723 cu. yd. excav., and Bridge 6461, 3 continuous slab spans, over Indian Creek, S.P. 7904-09 (Trunk Hy. 61-3), SN-A-FAP 327 (2). Plans deposit $3.80. O. L. Kipp, ch. engr., and E. J. Miller bridge engr.

Bids Asked September 18

New Jersey—S. Miller, Jr., comr., State Hy. Dpt., Trenton, grading, rein.-con. paving, bridging 1.593 mi. Route 24 Sect. 22, Route 24 N, Sect. 1 from 5 St. to Phillipsburg Toll Bridge Plaza, FAP SN-FAP-32A(4) and SN-FAP-32E (1) Warren Co. Plans deposit $10.

Bids Asked September 19

California—State Div. Hys., Sacramento, grading, asphaltic concrete pavement on crusher run base and penetration treatment 0.4 mi. to shoulders on Garrard Blvd. between Barrett and Pennsylvania Aves., Dist. IV, Richmond, Contra Costa Co. G. T. McCoy, state hy. engr.

Kansas—State Hy. Dpt., Smith Center, resurfacing material 10.142 mi. P. 26"8, Clay Norton Co.; 8.273 mi. P. 3785 AB, Phillips Co.; 6.16 mi. P. 3774; 6.3 mi. P. 3786, both Rawlins Co.; 1.26 mi. P. 3787 AB, Rooks Co.; 6.497 mi. P. 3778, 12.643 mi. P. 3778 ABC, both Smith Co.; 12.408 mi. P. 3789 AB, Trego Co.; 2.321 mi. P. 3784, Decatur Co.; 12.947 mi. P. K 3098, Cheyenne Co. R. C. Keeling, Topeka, engr.

Bids Asked September 21

California—G. T. McCoy, state hy. engr., State Office Bldg., Los Angeles, plant-mix resurfacing repairs 10.4 mi. and applying seal coat only to portions existing pavement in San Diego on Pacific Hy. between Bway. and Torrey Pines grade and on Rosecrans St. between Lytton St. and Cannon St., XI-SD-2, 12-SD, San Diego Co.; grading, plant mix surfacing 1.2 mi. Tippecanoe Ave. between 3 St. and Base Line Rd., Dist. VIII, San Bernardino Co.

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STREETS AND ROADS (Bids Asked, Con

Bids Asked September 6

Calif., Los Angeles — Bd. Supervs. L Angeles Co., Hall of Records, grading, phaltic concrete paving 17,560 sq. yd. W ington Blvd., Vail Ave. to Bluff Rd., Cost 538. Plans deposit $5, not refunded. O. Cooley, Hall of Records, road comr. O $25,000.

Bids Asked

Kansas—State Hy. Dpt., La Crosse, jected bids Aug. 11, single asphalt surf treating 6.23 mi. Proj. K 5058, Rush C CD 7/28—ENR 8/3.

LOW BIDDERS

Calif., Glendale—City, City Hall, Aug. 2 resurfacing 7,790 tons asphalt concrete C cord and other streets from Southwest Pa ing Co., 11402 Tuxford St., Roscoe, $ J. Albers, City Hall, city engr.

Ill., Chicago—O. B. Hawitt, consr. Dpt. Wks., City Hall, Aug. 23, concrete pavi East and West 103 St. from S. Halsted to S. Michigan Ave., from Calumet Coal C 9540 Marquette St., $169,663. CD 8/18.

Louisiana—State Dpt. Hys., Baton Roug impry., 50.6 mi. Vernon and Sabine Parish from T. L. James & Co., Inc., Ruston, $ 569. CD 8/7—ENR 8/10.

New Jersey—State Hy. Dpt., Trenton, Au 23, imprv. 0.957 mi. Bergen Co., from Stand ard Bitulithic Co., 50 Church St., New York N. Y., $213,584. CD 8/16—ENR 8/24.

Virginia—Dpt. Hys., Richmond, Aug. 1 imprv. 7.3 mi. Gloucester Co., from D. W Winkelman Co., Heffernan Bldg., Syracuse N. Y., $70,650; 2.4 mi. Accomac Co., fro G. P. Clay, 1213 Dinwoodie Ave., Richmond $217,000. CD 8/31—ENR 8/14.

CONTRACTS AWARDED

★**Alabama**—State Hy. Dpt., Montgomery imprv. 9.662 mi. Sumter Co. and surface treating 8.432 mi. and temporary facing 8.579 mi. Dallas Co., to E. J. W. L. Cobb Co., 803 Mobile Rd., Montgomery, $564,504 and $54,963 respectively; 1.663 mi. Jefferson Co.; to Southern Asphalt & Asphalt Co., 2401 4 Ave. N., Birmingham, $43,277***7.509 mi. Sumter Co., to Cobb Bros. Constr. Co., Citizens Bank Bldg., Meridian, Miss., $408,897. Grand total $1,060,941. Bids 8/25. CD 8/9 and 8/16—ENR 8/17.

†**Ala., Talladega**—U. S. Eng., Grant St. west of Westwood St., Mobile, paving, grading railroad work at Coosa River Ordnance plant, to Rust Engr. Co., Liberty Life Bldg., Birmingham, approx. $30,370.

★†**Calif., El Toro**—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., 25, D. C., paving, services Marine Corps Air Station, Spec. 14713, NOY 19198, to Basich Bros., 600 S. Freemont St., Alhambra, $285,000. CD 8/17 under LB, under Unclassified.

Georgia—State Hy. Dpt., Atlanta, widening, resurfacing, pavement, widening bridge at Dundee Canal, 3.476 mi. Savannah-Port Wentworth Rd., Chatham Co., to Wm. F. Bowe & Co., 540 Reynolds St., Augusta, $92,780. Bids 8/23.

Georgia—State Hy. Dpt., Atlanta, Aug. 18 imprv. 11.7 mi. Glynn Co., to J. B. Gibson Constr. Co., Donalsonville, $81,116; 5.3 mi. Towns Co., to A. W. Ledbetter, Rome, $54,956. CD 8/24—ENR 8/31, under LB.

Minnesota—State Hy. Dpt., St. Paul, imprv. 3.7 mi. S.P. 1130-07 between Cass Lake and Walker (Trunk Hy. 371-19), to Ulland Bros., Austin, $39,531. Bids 8/12. CD 8/2—ENR 8/10.

Minn., Wheaton—R. L. Johnson, and Traverse Co., gravelling Job 4491, to R. Ehrner, Wheaton, $28,100. Bids 8/12.

New Jersey—Union Co., Court House, Elizabeth, imprv. roads in Rahway, to Standard Bitulithic Co., 50 Church St., New York, N. Y. $33,885; Salem Rd., Union, to C. H. Winans Co., 125 Broad St., Elizabeth, $36,782.

†**R. I., Newport**—City, P. Wks. Dpt., City Hall, imprv. repairing, resurfacing Girard, Van Zandt, and Eustis Sts., Contr. 3, R.I. 37-164-N, to Callan Constr. Corp., 519 Hope St., Bristol, $48,608. FWA. CD 8/21—ENR 8/24.

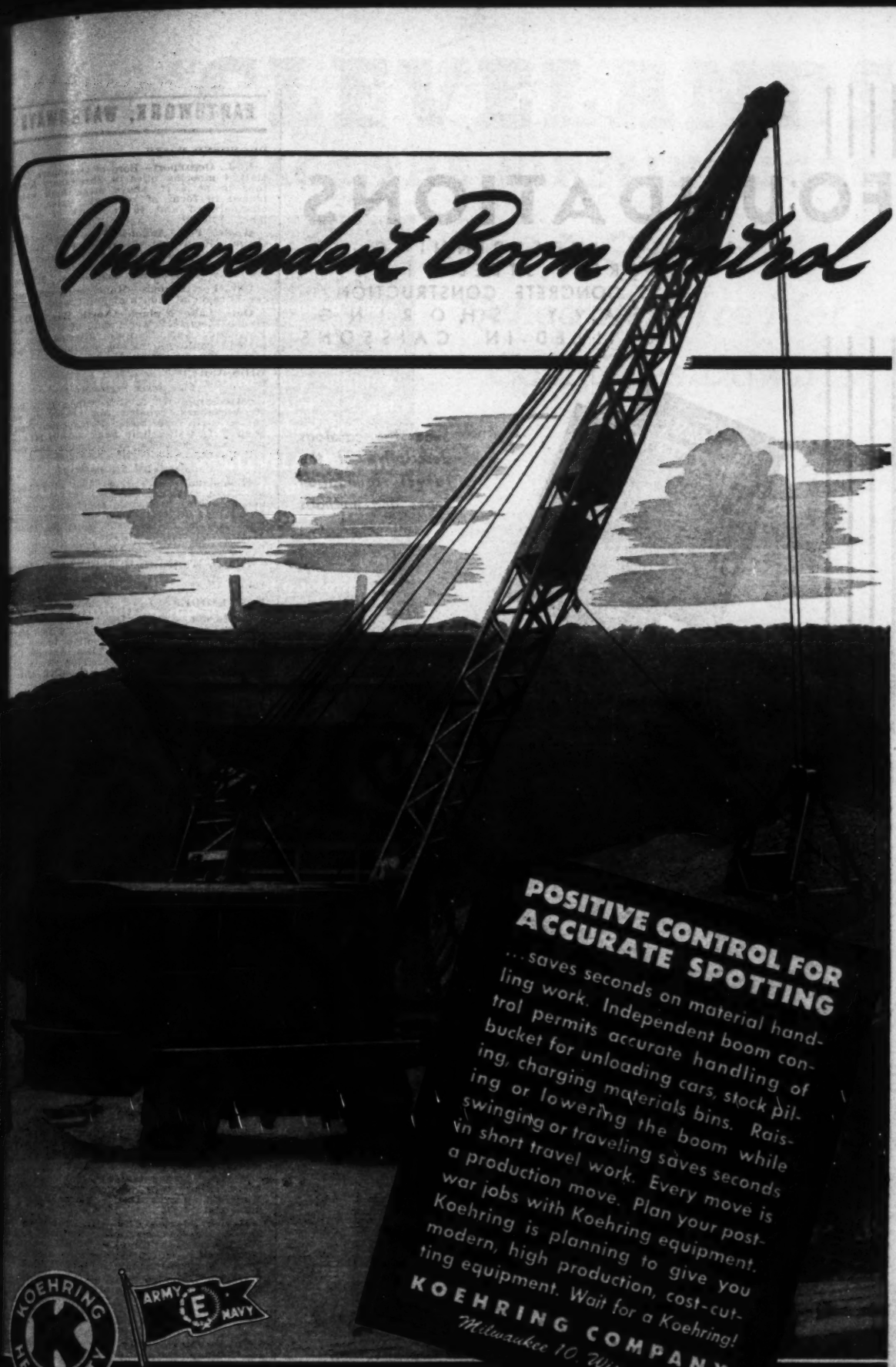
Tex., Alamo Heights—Town, 6114 Broadway, Alamo Heights, San Antonio, imprv. several streets, to W. A. Kelly Constr. Co., 2215 Belknap St., San Antonio, approx. $25,212. Bids 8/25. CD 8/15—ENR 8/17.

Tex., Houston—Concrete paving, grading, Park Place Blvd., to Gulf Bitulithic Co., 2330 Polk St., $30,749. G. L. Fugate, city engr.

Washington—State Hy. Dpt., Olympia, surfacing, oiling 0.227 mi. Hy. 15, King Co. and grading, draining, surfacing 1.259 mi. Hy. 1, Clallam Co., to Rush-Baird, Port Angeles, $62,307 and $47,123 respectively. Bids 8/23. CD 8/17.

Alta., Calgary—Municipality, gravelling, 4¼ mi. roads, oiling 6 sections, day labor, $65,389.

N. S., Westville—Town, T. W. Murray, clk., 2½ mi. highway work, drainage, gravel and asphaltic concrete paving, to Warren Bituminous Paving Co., Ltd., 1454 Bloor St. W., Toronto, Ont. About $50,000.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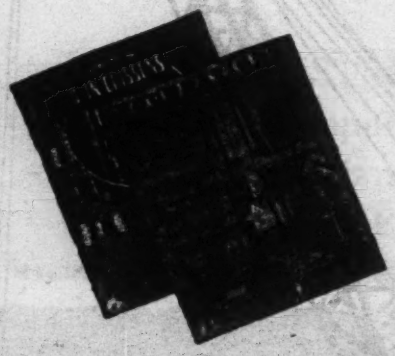

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PROPOSED WORK

N. J., Oceanport—Boro of Oceanport, Boro Hall, 4 mooring piles in Shrewsbury River, tops to be 5 ft. above mean high water, placed in form of rectangle, exten. 50 ft. channelward and 40 ft. south of existing pier. $25,000.

Wash., Port Angeles—Port Angeles Port Comn., H. W. Davis, mgr., Port Angeles, bond election Nov. 7, dredging 500x700 ft. basin and constructing 100x800 ft. breakwater to form fishing boat basin. $175,000.

Ont., Fort Francis—Municipality constructing harbour at mouth of Fog Creek. $30,000.

Ont., Lake Nipigon (North Bay, P.O.)—Hydro Electric Power Comn. of Ontario, 620 University Ave., Toronto, altering dam by placing earth fill on top and upstream fall of existing structure. $25,000.

BIDS ASKED

Bids Asked September 14

†**Mississippi**—U. S. Eng. Office, P. O. Box 60, Vicksburg, constructing 140,000 cu. yd. (net), earthwork along Potacocowa Creek, Item 2 L & R, right bank 44+04-144+00, left bank 29+10-63+06, Grenada and Carroll Counties, Solic. No. 22-052-45-16.

Bids Asked September 15

†**Louisiana**—U. S. Eng., foot of Prytania St., New Orleans, approx. 103,000 cu. yd. uncompacted earthwork, incidental work on Mississippi River Levees in Barataria and Lake Borgne Levee Dists., Solic. No. 16-047-45-11, Plaquemines Parish.

Bids Asked

†**Mass., Waltham**—U. S. Eng., 31 St. James Ave., Boston, top grading, seeding, No. 19-023-45-Neg-17. $20,000.

LOW BIDDERS

California — State Div. Hys., 808 State Bldg., Los Angeles, Aug. 24, 6 mi. place rail and wire hank protection fences and packed concrete riprap, Los Angeles Co., from Bonadamin-McCain, 1709 W. 8 St., Los Angeles. $32,207. CD 8/4—ENR 8/10.

CONTRACTS AWARDED

Conn., Hartford—City, Bd. Contr. & Supply, Municipal Bldg. 550 Main St., flood control project, constructing pond, incl. excav., filling, stone masonry, Contr. 30, to A. Sangivanni & Sons, 21 Bailey Ave., Meriden. $21,139. Bids 8/22.

†**Mass., New Bedford**—U. S. Eng., 819 Industrial Trust Bldg., Providence, R. I., maintenance dredging, removing ledge rock, No. 45/2, to Arundel Corp, foot of Fulton St., Brooklyn, N. Y. $36,646. Bids 8/10. CD 8/15.

†**Ore., Eugene**—U. S. Eng., Pittock Blk, Portland, core drilling, appurtenant work at Meridian damsite, to Lynch Bros., 3635 Woodland Park Ave., Seattle. $29,700.

LATIN AMERICA

Argentina, San Juan—Government of San Juan Province, San Juan, plans constructing colony homes for orphans. $200,000.

Brazil, Rio de Janeiro—Brazilian Traction Light & Power Co., Ltd., Rio de Janeiro, plans generating facilities addn. in Rio de Janeiro area and constructing new 35,000 kw. unit. $700,000.

Brazil, Sao Luis—Government of Brazil, Rio de Janeiro, plans railway line to link with Sao Luis with Recife. $1,000,000.

Colombia, Bogota—Government of Colombia, plans railway line to give direct rail connection between Bogota and port of Buenaventura and extension of Pacific Railway from Popayan to Ecuadorean border. $10,000,000.

Mexico, Acapulco—Pesquera y Armadora del Pacifico Fred N. Angivine, pres., takes bids in 30 days constructing fish factory. $50,000.

Mexico, Atzcapotzalco — Municipal Govt., Lic. Javier Rojo Gomez, regent, Palacio Muncipal, Mexico D. F., plans creation of industrial city.

Mexico, Mexico City—Cia. Textil de San Javier, Jorge Gonzalz, G. Ballina, Valetin Martinez and Antonio Martinez, organizers, Mexico City, will probably take bids in 100 days, constructing textile factory. $250,000.

Mexico, Mexico City — Government of Mexico, plans rehabilitating main line of National Railways and completion extensions and feeder lines, constructing 465 mi. line linking 2 gulf ports of Puerto Mexico and Campeche. $20,000,000.

Mexico, Mexico City—Government of Mexico, plans Union Railway terminal. $12,000,000.

Mexico, Mexico City—Manufacturas Metalicas Arieta, Enrique de Zunzunegui Celayeta and Ricardo Garza Galindo, directors, Mexico City, take bids in late winter, constructing steel products factory. $65,000.

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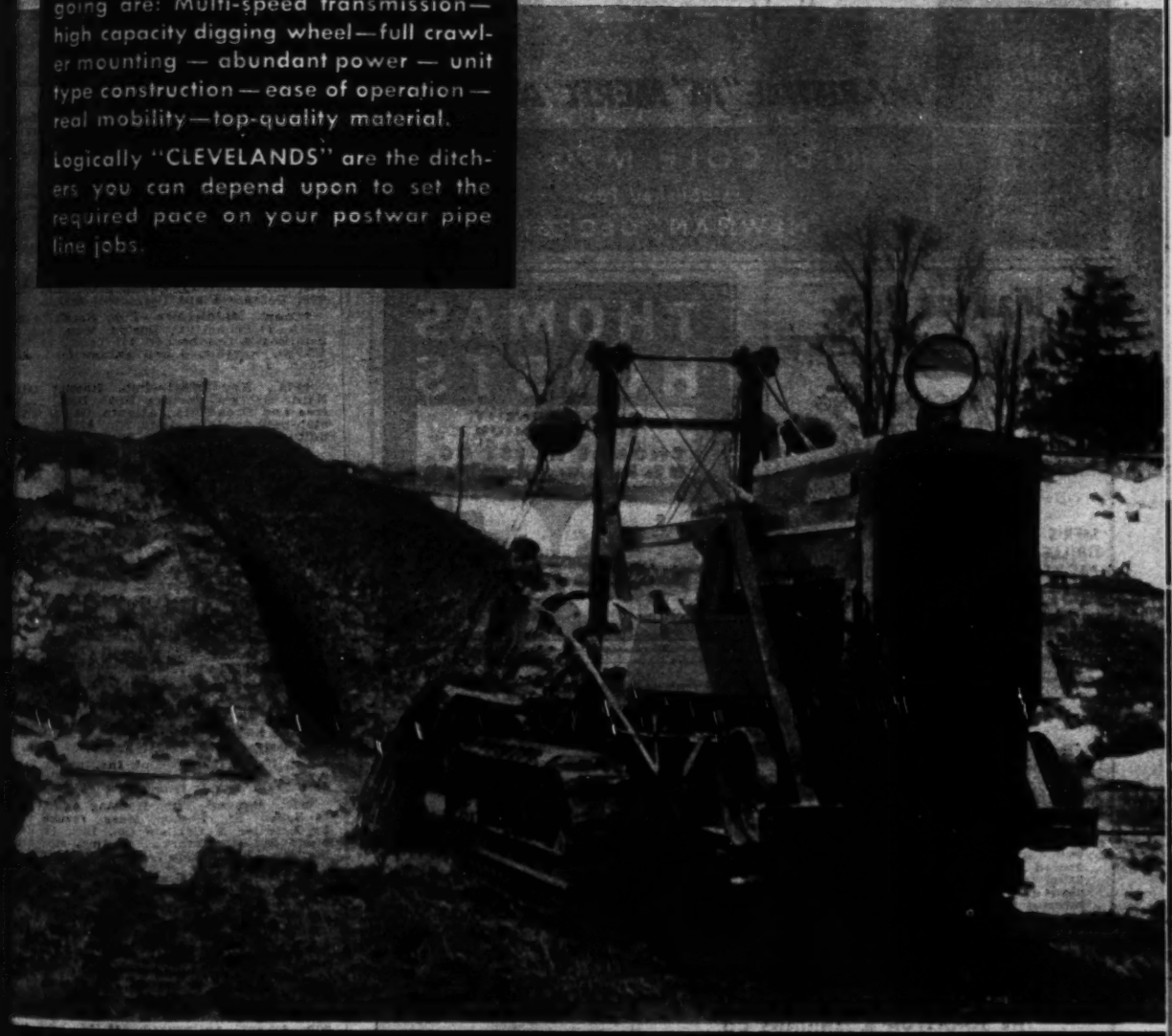

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LATIN AMERICA (Cont'd.)

Mexico, Juchique de Ferrer—City, Mayor Sostenes Lara, takes bids within 90 days constructing water sys. $50,000.

Mexico, Monterrey—State of Nuevo Leon, Governor Arturo B. de la Garza, Monterrey, plans super highway to be called Congregacion Calles. $150,000.

Mexico, Puchuca—State of Hidalgo, Governor Jose Lugo Guerrero, Puchuca, takes bids within 90 days, constructing water sys. $250,000.

Mexico, Sabinas—City, (State Aid, Governor Jose Lugo Guerrero, Puchaca), will construct school center, playgrounds, etc., by own forces. $150,000.

Mexico, San Luis Potosi—State of San Luis Potosi, Governor Benacio Lopez Padilla, San Luis Potosi, will construct pipe factory, by own forces. $55,000.

Mexico, Tlaxcala — Municipal Government, Palacio Municipal, Tlaxcala, plans improv., expanding sewerage sys. $55,000.

Mexico, Puebla — Municipal Government, Palacio Municipal, Puebla, plans moderating WW. $90,000.

Venezuela, Caracas—Sociedad Promotora de la Campania Gran Ferrocarril de Los Llanos, plans railway line from Caracas to Republic's cattle producing areas. $32,000,000.

Mexico, Tamazulapam — City, Sr. Alfonso Caso, takes bids in November, constructing normal school group. $400,000. Federal Government and State of Oaxaca will aid in financing.

Mexico, Torreon—State of Coahuila, Governor Benecio Lopez Padilla, will construct and repair Saltillo-Piedras Negras Hy., by own forces. $125,000.

PUBLIC BUILDINGS

PROPOSED WORK

†**Calif., Berkeley**—Berkeley General Hospital, 2061 Dwight Way, plans by Reese & McGuinness, 433 Pine St., San Francisco, hospital addn., Calif. 4-646. $435,000. FWA. CD 8/30.

†**Calif., Fetters Spring**—Flowery Elementary School Dist., temporary 3 classroom and auxiliary room school and small sewage disposal sys., Calif. 4-639-F. $30,300. FWA.

†**Calif., Redwood City**—Redwood City Elementary School Dist., nursery, Calif. 4-641-F. $30,700. FWA.

†**Conn., Danbury**—The Danbury Rubber Co. Inc., Danbury, addnl. plant bldgs. $30,000. Defense Plant Corp. will finance.

†**Conn., Middletown**—Pub. Housing Auth., NHA, 24 School St., Boston, Mass., plans by Schilling & Goldbecker, 406 Temple St., New Haven, warehouse and garage for housing Conn. 9-1.

†**Fla., Key West**—Pub. Housing Auth., NHA, Georgia Savings Bank Bldg., Peachtree and Broad Sts., Atlanta, Ga., 20 family stop-gap dwelling units, Fla. 3256; 20 single unit stop-gap dwelling units, Fla. 3257.

†**Ga., Carterville**—Pub. Housing Auth., NHA, Georgia Savings Bank Bldg., Peachtree and Broad Sts., Atlanta, 25 family stop-gap dwelling units, Ga. 9176.

†**Ga., Marietta**—City, 1 story, bsmt., recreation bldg., Ga. 9-314-N. $150,000. FWA.

†**Ill., Chicago**—Pub. Housing Auth., NHA, 201 N. Wells St., Zone 6, 1 story, war nursery and child care center designed as part of community bldg., Ill. 11-339-F. $45,000. FWA.

†**Ill., Seneca**—Pub. Housing Auth., NHA, 201 N. Wells St., Chicago, Zone 6, plans by L. Gerding, La Salle, 1 story, 75 x 135 ft. community bldgs.

†**Ind., Hobart**—School City of Hobart, 1 story school, Ind. 13-215-N. $74,000. FWA.

†**Ind., Kingsford Heights**—Pub. Housing Auth., NHA, 201 N. Wells St., Chicago, Ill., rehabilitating, partially equipping part 1 story commercial bldg. for use as nursery and converting parking space into play area for children. Ind. 13-217-F. $12,488. FWA.

La., Baton Rouge—Dpt. Institutions, Baton Rouge, juvenile delinquent school on 500 acre tract, 9 mi. from here. $350,000.

†**Me., Bangor**—Pub. Housing Auth., NHA, 24 School St., Boston, Mass., revised plans by Prentiss & Carlisle Co., Inc., 11 Hammond St., site improvs., grading, etc., housing, Me. 17011. Bids 7/19 rejected. CD 1/14.

†**Md., Havre de Grace**—Bd. Educ. Harford Co., Bel Air, 4 classroom bldg. addns., alterations on site of housing known as Concord Fields, Md. 18-213-F. $37,300. FWA.

†**Mich., Ecorse Twp.**—School Dist. Ecorse Twp., school, Mich. 20-270-N. $74,039. FWA.

†**Mich., Flat Rock**—Pub. Housing Auth., NHA, 3073 E. 19 St., Cleveland, 18, O. 50 unit single person housing, Mich. 20258.

Miss., Batesville—Town, c/o D. L. Ferguson, mayor, authorized $60,000 bond election hosiery plant.

†**Miss., Gulfport**—Bd. Supervs. Harrison Co., Gulfport, 1 story, 60x136 ft. health center, Miss. 22-302-N. $60,000. FWA.

PUBLIC BLDGS. (Proposed Work, Cont'd.)

Miss., Philadelphia—Town, D. Stribling, authorized $80,000 bond election ...ove factory.

...N. J., Lake Denmark—Yards & Docks, ...Dpt., 18 St. and Constitution Ave. ...W., Wash., 25, D. C., architect-engineer ...vices by H. A. Kelly, B. Bummer Greyon, ...1 Bergen Ave., Jersey City, "M" barracks ...l bldg.

...N. Y., Amherst—Common School Dist. ...1, Amherst, bids soon school addn., N.Y. ...-313-N. $50,000. FWA. W. C. Lurkey, ...Main St., Buffalo, archt. CD 8/18—ENR 8/24.

...N. Y., Lido Beach (br. Long Beach)—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., 25, D. C., magazines and roads at Naval Anti-Aircraft Training Center.

...N. Y., West Point—U. S. Eng., 120 Wall St., New York, Zone 5, bids soon storage bldg., etc. $35,000.

...N. C., Morehead City—Town, 3 story hospital addn., N. C., 21-292-F. $179,000. FWA.

...Ore., Hood River—Pub. Housing Auth., NHA, Skinner Bldg., 5 Ave. and Union St., Seattle, Zone 1, Wash., 50 unit family stop-gap housing, Ore. 36299.

...Pa., Bethlehem—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., 25, D. C., architect-engineer services for Fraser-Brace Engr. Co., Inc., 10 E. 40 St., New York, N. Y., for cost and repair of project forge shop, Bethlehem Steel Co., Bethlehem.

...Pa., Martinsville—Martinsville General Hospital, Inc., Martinsville, 3 story general hospital, 2 story, nurses home, etc. Va. 44-370-N. $622,000. FWA.

...Pa., Portsmouth—Bd. Supervs. Norfolk Co., Portsmouth, two 1 story, office and storage bldgs. with storage sheds, Va. 44-...-N. $70,500. FWA.

...Pa., Portsmouth—Norfolk County School Bd., 141 Granby St., Norfolk, school, site improvs., etc. Cradock, Va. 44-163-F (re-...) $804,612. FWA. CD 8/3—ENR 8/10.

...Wash., Parks—Pub. Housing Auth., NHA, Skinner Bldg., 5 Ave. and Union St., Zone 1, Seattle, 20 unit family dwellings, Wash. ...671.

...Wis., Baraboo—Sisters of St. Mary, Baraboo, 3 story, part bsmt., addn., alterations to St. Mary's Ringling Hospital, Wis. 47-132-N. $50,000. FWA.

Alaska, Anchorage—City, City Hall, city hall addns. $300,000.

BIDS ASKED

Bids Asked September 12

...Conn., Groton—Town, S. B. Butler, supt. Schools, Groton, brick, cinder block Robert Fitch High School addn., Pequonnock Rd., Conn. 6-129-N. $95,000. FWA. Plans deposit $25 ea., sets; Scholfield & Lindsay, 309 Bank St., New London, archts. CD 8/29—ENR 8/1.

...Md., Laurel—District Comrs., District Bldg., Wash., D. C., Dormitory E at District Training School, 3 mi. from here. $80,000. Plans deposit $20.

...N. J., Bridgeton—Bd. Educ., Upper Deerfield Twp., Bridgeton, school addn., N.J. 28179-N. $70,000. FWA. Extended date. J. H. Hettel, 501 Cooper St., Camden, archt. CD 8/23—ENR 8/24.

...N. J., Somerville—Somerset Hospital, 28 Rehill Ave., hospital addn., N.J. 28-177. $700,000. FWA. Plans deposit $30. Extended date. Crow, Lewis & Wick, 200 5 Ave., New York, 10, N. Y., archts. CD 8/23—ENR 8/31.

...Pennsylvania—Pub. Housing Auth., NHA, 270 Bway., New York, 7, N. Y., site improvs. at Ohio View Acres, Stowe Twp., Allegheny Co., Pa. 36171. Plans deposit $25. CD 8/...—ENR 8/18.

Bids Asked After September 15

...Pa., Lebanon—Veterans Admin., Vermont Ave. between H and I Sts. N.W., Wash., 25, D. C., hospital bldgs. $2,000,000. CD 8/17—ENR 8/24.

Bids Asked September 19

...Ont., London—Dpt. P. Wks., Ottawa, Ont., administration bldg., dining room-kitchen bldg., 8 pavilions and treatment bldg., at London Health and Occupational Centre, Westminster Hospital, $500,000. Plans deposit $50. C. D. Sutherland, c/o owner, archt. CD 8/17—ENR 8/25.

...Va., Charlottesville—University of Virginia, Charlottesville, part 4 story, bsmnt., and part 3 story, nurses home addn., Va. 44-351. $295,000. FWA. Plans deposit $20. Taylor & Fisher, 1012 N. Calvert St., Baltimore, Md., archts. CD 8/14—ENR 8/17.

Bids Asked About September 27

...Pa., Norristown—Dpt. Welfare, c/o Dpt. Property & Supplies, Capitol Bldg., Harrisburg, Ward Bldg. 51, Norristown State Hospital, $800,000. Howell, Lewis & Shay, Packard Bldg., Phila., archts. CD 8/17—ENR 8/24.

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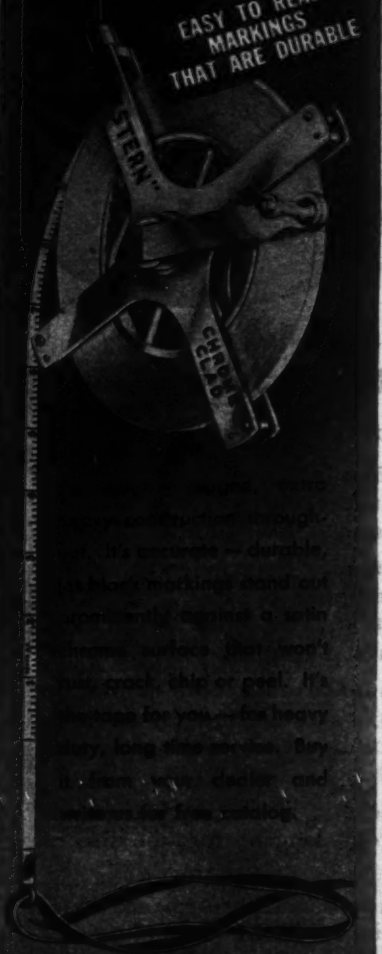

LUFKIN

SAGINAW, MICHIGAN · New York City

TAPES · RULES · PRECISION TOOLS

PUBLIC BLDGS. (Bids Asked, Cont'd.)

†Me., Portland—Pub. Housing Auth., NHA, 24 School St., Boston, Mass., paving, resurfacing for war housing, Me. 17036.

†Mass., Chicopee—U. S. Eng., 31 St. James Ave., Boston (selected list bidders), bldg., incl. fence, No. 19-023-45-Neg-18. $30,000.

LOW BIDDERS

Calif., San Diego—Bd. Supervs. San Diego Co., Civic Center Bldg., Aug. 14, 1 story, 110x182 ft. psychopathic ward addn. at Edgemoor Farm, 1 story boiler room bldg., both rein.-con., from Stanton-Reed Co., 816 W. 5 St., Los Angeles, $174,785. CD 5/9—ENR 5/11.

†Calif., San Diego—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash., 25, D. C., Aug. 29, Frontier School, Calif. 4-584-1, Milway School, Calif. 4-584-2, Barnard School, Calif. 4-584-3, from A. L. Henderson Co., P. O. Box 476, Charlotte, N. C., Bid 1, $251,388, Bid 2, $210,782. FWA. CD 8/7—ENR 8/10.

†D. C., Wash.—U. S. Eng., 1 and Douglas Sts. N.W., Zone 25, Aug. 29, gymnasium bldg. for Walter Reed Hospital, from Herring & McCall, 5303 Baltimore Ave., Hyattsville, Md., $243,000. CD 8/24.

†Ga., Warner Robins—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash., 25, D. C., Aug. 29, three 1 story schools, Ga. 9-285, from A. L. Henderson, P. O. Box 476, Charlotte, 2, N. C., $210,782. CD 8/15—ENR 8/17.

†Mass., Watertown (br. Boston)—U. S. Eng., 31 St. James Ave., Boston, Aug. 29, 2 machine tool storage bldgs., Watertown Arsenal, No. 19-023-45-Neg-15, from Thomas O'Connor & Co., 238 Main St., Cambridge, Mass. Est. $100,000. CD 8/29—ENR 8/31.

†Ore., Portland—Northwestern Ice & Cold Storage Co., 68 S.E. Washington St., Aug. 22, altering cold storage plant, from Ross B. Hammond Co., 1241 N. Williams St., $228,893. Defense Plant Corp. will finance. E. G. Zeller, McKay Bldg., archt. CD 5/24—ENR 6/1.

†Wash., Vancouver—Pub. Housing Auth., NHA, Skinner Bldg., 5 Ave. and Union St., Seattle, Zone 1, Aug. 16, soil erosion control, sidewalk and curb work, Proj. 45122, from K. L. Strandberg, Olympia, $33,318.

CONTRACTS AWARDED

★†Calif., Hunters Point—Pub. Housing Auth., NHA, Phelan Bldg., San Francisco, furnishing, transporting, erecting 500 pre-fabricated portable dwelling units, Calif. 4866, to C. T. Lindsay, 824 Taraval St., San Francisco. $556,000. CD 8/24—ENR 8/31, under LB.

†Calif., Mare Island—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., 25, D. C., Torpedo Storage Bldg. 757 at Navy Yard, Spec. 14096, NOY 9582, to Jacks & Irvin, 620 Market St., San Francisco, $58,519.

†Calif., Port Chicago—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., 25, D. C., segregation bldg. fdns., Naval Magazine, NOY 10544, to Raymond Concrete Pile Co., 140 Cedar St., New York, N. Y., $84,625.

★†Calif., San Francisco—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., 25, D. C., U. S. Naval Fleet Hospital 113, NOY 10437, to J. H. Pomeroy & Co., 333 Montgomery St., San Francisco, $589,100. Weihe, Frick & Druse, 251 Kearny St., engrs. and archts. CD 8/10.

★†Conn., Naugatuck—Naugatuck Chemical Div., U. S. Rubber Co., Elm St., 2 story, 40x110 ft., and 2 story, 80x180 ft., brick, steel bldgs., 2 out bldgs., road construction, drainage, to E. & F. Constr. Co., 94 Wells St., Bridgeport. Est. $700,000. Defense Plant Corp. will finance. Fletcher Thompson, Inc., 811 State St., Bridgeport, engrs. CD 8/1—ENR 8/3.

†Conn., New Britain—Pub. Housing Auth., NHA, 24 School St., Boston, grading, drainage, Conn. 6033, to Tebaldi Supply Co., 479 Main St., Indian Orchard, Mass., $24,977. Bids 8/25. CD 8/17.

★†Colo., Denver—U. S. Eng., 209 17 St., converting Rocky Mountain arsenal and constructing 2 addnl. bldgs., to Kershaw, Swinerton & Walberg, c/o Rocky Mountain Arsenal, Denver, $1,500,000.

★†Miss., Aberdeen—U. S. Eng., Grant St. west of Westwood St., Mobile, Ala., load line at Gulf Ordnance plant, to Foster-Creighton Co., 824 American Bank Bldg. and Oman Constr. Co., Acklen Park, both Nashville, Tenn., $1,300,000.

†N. J., Fort Dix—U. S. Eng., Penn Mutual Bldg., 6 and Walnut Sts., Phila., Pa., installing automatic sprinkler sys., motor repair shop, to Central Automatic Sprinkler Sys., 243 E. Ashmead St., Phila., Pa., $27,918. Bids 8/24, awarded 8/28.

★†N. Y., Hicksville—Glasdoss Corp., 155 E. 44 St., New York, Zone 17, design and construction mfg. plant, to Austin Co., 19 Rector St., New York, Zone 6. Est. $2,500,000. Defense Plant Corp. will finance.

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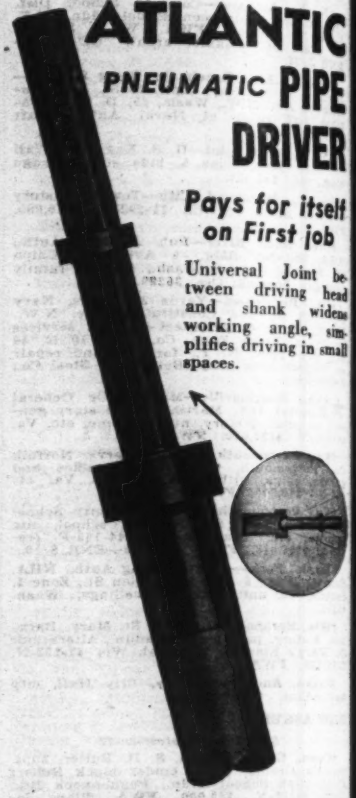
Universal Joint between driving head and shank widens working angle, simplifies driving in small spaces.



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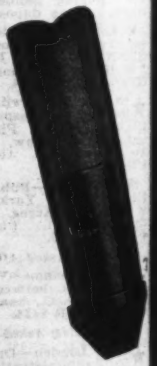

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PUBLIC BLDGS., etc. (Contracts Awarded, Cont'd.)

★O., Addyston—U. S. Eng., 522 U. S. Post Office & Courthouse, Cincinnati, foundry addns., to Austin Co., 16112 Euclid Ave., Cleveland. Est. $350,000. U. S. Pipe & Foundry Co., Burlington, N. J., will operate. CD 9/1, under Industrial Bldgs.

★Pa., New Kensington—Westmoreland Co. Housing Auth., 403 Coulter Bldg., Greensburg, site imprvs., replacement concrete walks, steps, grading site for drainage connections, walls, drainage structures and storm water pipings, etc., Aluminum City Terrace Housing, Pa. 24-111, to Del Val Constr. Co., 117 Harwood Bldg., Scarsdale, N. Y., $87,700. CD 8/4.

★Utah, Clearfield—Yards & Docks, Navy Dept., 18 St. and Constitution Ave. N.W., Wash., D. C., 8 addnl. storehouses, Naval Supply Depot, NOY 9436, to Utah Const. Co., and J. K. Pomeroy & Co., P. O. Box 1590, Salt Lake City, Zone 11. $3,038,701. Bids 8/15. CD 8/29 under CA and 8/18 under LB.

★Va., Front Royal—General Chemical Co., 40 Rector St., New York, N. Y., sulphuric acid chemical plant, to F. H. McGraw Co., 730 Windsor St., Hartford, Conn. Cost over $1,000,000. Defense Plant Corp. will finance. CD 2/7—ENR 2/10.

COMMERCIAL BUILDINGS

PROPOSED WORK

La., Alexandria—Baptist Hospital, Mrs. H. O. Parker, asst. supt., Alexandria, plans by E. F. Neild, City Bank Bldg., Shreveport, main bldg., nurses' home, imprvs. at Baptist Hospital.

Mich., Detroit—Mt. Carmel Mercy Hospital, 6071 West Outer Dr., plans by C. J. Sullivan, 3431 Woodward Ave., brick, steel, concrete, stone hospital addn. $300,000.

★N. J., Newark—Union Irvington Land Imprvt. Co., 24 Commerce St., plans by McMurray & Schmidlin, 968 Stuyvesant Ave., Union, 40 unit, 3 story, brick veneer garden apartment, Schley St. $600,000.

Pa., Danville—Geo. F. Geisinger Memorial Hospital, Danville, soon lets contract boiler house. $155,000. W. H. Lee, 1505 Race St., Phila., archt.

Pa., Erie—St. Vincents Hospital, Sister Anna Marie, chg. supt., 1230 Plum St., plans by Meyers & Johnson, 821 Commerce St., 4 story, bsmnt., brick, steel, nurses home. $300,000. Applied to FWA. Mayer & Valentine, 2036 22 St., Cleveland, O., plumbing and heating engrs. CD 8/4—ENR 8/17.

Tex., Houston—Santa Rosa Building Co., 7142 Park Pl. Blvd. plans by J. Knostman, 2017 W. Gray St., Houston, 30 new dwellings. $150,000.

Tex., San Antonio—W. H. Moore & Son, 215 Haycyon St., frame type dwellings. $150,000.

Tex., San Antonio—Fidelity Defense Housing Co., 401 Linares St., frame type dwellings. $150,000.

Tex., San Antonio—Pinecrest Housing Development Co., 701 Linares St., 31 dwellings, utilities, etc. $150,000.

BIDS ASKED

Bids Asked September 11

Pa., New Kensington — Citizens General Hospital, L. C. French, supt., New Kensington, 1½ story, 60 x 60 ft. boiler house, 1 story, laundry, both brick, steel, $75,000. CD 4/21—ENR 4/27.

CONTRACTS AWARDED

Calif., Long Beach — Economy Housing Corp., 3750 E. Carson St., 55 frame, stucco dwellings Owner builds. $200,000.

Tex., Keene—Southwestern Jr. College, Keene, 3 story, brick, 43x216 ft. boys' dormitory, concrete, to Homer A. Parks Constr. Co., Construction Bldg., Dallas, $179,500. Eqt. $150,000. CD 8/25—ENR 8/31.

Ont., Windsor—J. C. Pennington, archt., Canadian Bank of Commerce Bldg., hospital addn. for Sisters of Hotel Dieu, 1014 Oulette Ave., to Sterling Constr. Co., Ltd., 2492 Sandwich St. E., about $175,000. CD 7/31—ENR 8/3.

INDUSTRIAL BUILDINGS

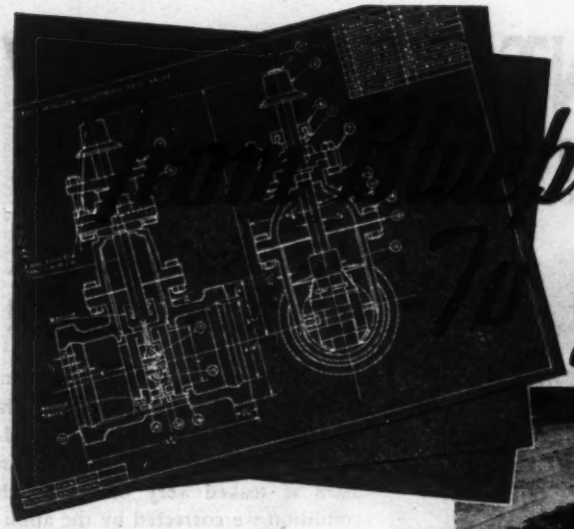
PROPOSED WORK

Calif., Fresno—DISTILLERY AND WINERY — The Bisceglia Brother Wine Co., Mattei Bldg., 4 to 5 m.g. concrete distillery and winery bldg., on 20 acre tract California and Cedar Aves. $300,000.

Calif., Newhall—OIL REFINERY—Newhall Refinery, 917 Newhall Ave., reconstructing oil refinery. Over $40,000.

Conn., Fairfield—TRUCK TERMINAL—Associated Transport, Inc., c/o A. J. Carson, archt., 325 Memorial Ave., West Springfield, Mass., sketches steel, concrete freight truck terminal. $40,000.

Conn., Naugatuck — PLANT — Naugatuck Chemical Div. U. S. Rubber Co., Elm St., soon lets contract chemical mfg. plant. $100,000. Francisco & Jacobus, 511 5 Ave., New York 17, N. Y., archts. CD 6/26—ENR 6/29.



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INDUSTRIAL BLDGS. (Proposed Work, Cont'd.)

Conn., Stratford — AIRCRAFT PLANT STRATOSPHERE FACILITIES — Chance Vought Div. United Aircraft Corp., 550 Main St., soon lets contract stratosphere facilities, aircraft plant, Main St. Over $40,000. Albert Kahn, Associated Architects & Engineers, Inc., 345 New Center Bldg., Detroit, Mich., engrs.

★**La., Shreveport**—PLANT—Brewster Co., 50 Fannin St., 1 story, 140 x 320 ft., masonry, steel mfg. plant, railway spur, etc. $700,000. R. M. Freeman & Associates, City Bank Bldg., engr.

Mich., Benton Harbor—FACTORY—Saranac Machine Co., 376 W. Main St., plans by H. W. Harper, Benton Harbor, 1 story, 85 x 160 ft., brick, steel, concrete factory. $45,000.

★**Mass., Chelsea** — FACTORY — Panther-Panco Rubber Co., Inc., 31 Highland St., making plans 1 story, bamnt., 150 x 400 ft., brick, steel factory, concrete fdn. $500,000. Waghorne-Brown Co., 44 School St., Boston, engrs.

Mich., Detroit—DIE SHOP—Murray Corp. of America, 7700 Russell St., brick, rein.-con. die shop addn. $75,000. Giffels & Vallet & Rossetti, 1000 Marquette Bldg., engrs.-archts.

Mont., Laurel—REFINERY—Independent Refining Co. Div. Farmers Union Central Exchange, 12 3 St. N.W., Great Falls, A. Thomson, mgr., Laurel, refinery addn., new cracking furnace and cracking plant fractionating column, etc., $250,000.

Idaho, Paul—FACTORY—J. R. Simplot, 1824 Everett St., Caldwell, starch factory. $60,000.

N. J., Harrison—PLANT—R. C. A. Mfg. Co., 415 S. 5 St., 1 story, brick, steel chemical preparation plant. $40,000. Balmond Scrimshaw Co., 526 Elm St., Arlington, engr.

N. J., Newark—SHOP—Four Plating Co., 179 South St., plans by B. Cirlincione, 311 S. Orange Ave., 3 story, brick plating shop addn. $45,000.

N. J., Woodridge—GARAGE—Wright Aeronautical Corp., 132 Beckwith Ave., Paterson, soon lets contract, concrete block, hollow tile service garage, Plant 7.

N. M., Monument—BOILER PLANT, etc. —Chas. E. Johnson & Co., Monument, boiler plant, installing desulphurization unit. $225,000.

O., Belleville—STORAGE ELEVATORS—Spencer-Kellogg & Sons, Inc., T. G. Stone, purch. agt., Niagara Sq., Buffalo, 5, N. Y., storage elevators. $150,000. James Stewart Corp., 343 S. Dearborn St., Chicago, Ill., engr.

O., Cuyahoga Falls—FACTORY—Preuform Mold Co., Cuyahoga Falls, 1 story, factory addn., Main St., between Broad Blvd. and Portage Trail. $50,000.

O., Toledo—PLANT—American Propeller Corp., 1333 Alexis St., plant bldg. repairs. $160,000.

R. I., Bristol—FACTORY—United States Rubber Co., 500 Wood St., plans completed, brick, concrete factory. Over $40,000. C. R. Makepeace & Co., 439 Grosvenor Bldg., Providence, engrs.

Tex., DeLeon—PLANT—Ross & Thieband, DeLeon, soon lets contract, frozen food locker and processing plant. Over $40,000. Plans deposit $25. P. G. Bentley, 407 Burt Bldg., Dallas, engr. CD 8/25—ENR 8/31.

Tex., Fort Worth—WAREHOUSES—Consolidated-Vultee Aircraft Corp., Grants Lane, Fort Worth, plans by The Austin Co., Clifford Ave., 3 warehouses. $100,000.

Tex., Goldthwaite—FROZEN FOOD LOCKER & PROCESSING PLANT—County Locker Corp., Goldthwaite, soon lets contract, frozen food locker and processing plant. $40,000. Plans deposit $25. P. G. Bentley, 407 Burt Bldg., Dallas, engr. CD 8/25—ENR 8/31.

Tex., Houston — WAREHOUSE — Morris Wholesale Co., 3201 Polk St., 1 story, brick, concrete, hollow tile warehouse. $40,000.

Tenn., Jackson—FACTORY—S. Karpen & Bros., c/o H. Craig, 666 N. Lake Shore Dr., Chicago, Ill., brick, concrete, steel factory. $40,000.

Tex., Wallace—PACKING PLANT—Missouri Pacific R. R. Co., E. F. Bates, ch. engr., Missouri Pacific Bldg., St. Louis, 3, Mo., citrus and vegetable packing plant, brick, rein.-con., $40,000.

Tex., Houston—WAREHOUSE—Owner, c/o M. Moore, archt., 2008 W. Alabama St., 88 x 125 ft., brick, rein.-con., hollow tile warehouse. $40,000.

Tex., Houston—SERVICE & STORAGE STATION—Pure Oil Co., Esperson Bldg., 1 story, hollow tile, concrete service and storage station, steel tanks, etc. Over $45,000.

Tex., Houston—PLANT—Universal Packing & Gasket Co., 1313 Nance St., plans by M. Moore, 2017 W. Gray St., 1 story, hollow tile, concrete, steel, etc., plant unit. $45,000.

Tex., McAllen—PACKING PLANT—McAllen Fruit & Vegetable Co., H. Etchison, pres., 1622 Hwy., McAllen, bids soon 2 story, 190 x 218 ft., brick, rein.-con., steel, tile packing plant, N. 23 St. and M. P. R. R. siding. $100,000.

DUSTRIAL BUILDINGS (Proposed Work, Cont'd.)

Tex., McAllen—STORAGE, etc.—Z. M. ...gan Ladies Supply Co., 7 S. Main St., ...story, 140 x 140 ft. storage and display ...g. $31,000.

Wash., Bellingham—PLANT—Belling... ...ham Iron Works, A. W. Talbot, pres., ...ingham, cold storage plant. $500,000.

Wash., Vancouver—BREWERY—Interstate ...wery Co., 615 Columbia St., plans by ...W. Wahlak, Chambers Blk., Olympia, ...tory, masonry brewery addn. $44,500.

...B. C., Vancouver—PLANT—Gypsum, ...Lime & Alabastine, Canada, Ltd., 509 ...hards St., reconstructing plant, first unit ...r 1 story 200 x 400 ft. plaster mill, in ...chminster. $500,000.

...S ASKED

...bids Listed Soon After September 1

Tex., Harlingen—PLANT—Stuart Farms ...ous Packing Plant, Harlingen, 1 and 2 ...ry citrus packing and processing plant, ...k, rein.-con. $40,000. CD 8/29—ENR 8/31.

...NTRACTS AWARDED

Calif., Richmond—PLANT—The Oronite ...Chemical Co., subsidiary of Standard Oil ..., Russ Bldg., San Francisco, plant manu... ...facturing phthalic anhydride, basic stock for ...ate finishes on site adjacent to Standard ...Refinery, to E. D. Badger & Sons, 75 Pitt ..., Boston, Mass. $1,000,000.

Calif., Los Angeles—FACTORY—O. E. ...ith Corp., 5701 Smithway, 81x240 ft., ...ol factory bldg., in Bandini Dist., to The ...orta Co., 777 E. Washington St., $45,000. ...E. Schmidt, 777 E. Washington St., engr.

Conn., Bridgeport—OIL TERMINAL—...arkley Brothers, 30 Seaview Ave., oil ter...inal, 2 oil tanks, etc., to Chicago Bridge ...Iron Works, 333 S. Michigan St., Chicago, ...Ill. Est. $300,000. CD 8/9—ENR 8/17.

Conn., Fairfield — FACTORY — Bridgeport ...Molded Products Co., 105 Meadow St., 1 ...ory, 64x247 ft., and 80x247 ft., concrete ...ock factory, Meadow St., to W. G. Storch, ...e, 1 Hanson Pl., Brooklyn, N. Y. Est. ...$80,000. H. C. Elton, 1188 Main St., Bridge...rt, archt. CD 7/25—ENR 7/27.

Conn., Westport—PLANT—Wassell Organi...ation, W. State St., 1 story, 65 x 185 ft., ...brick assembly plant sales unit, Post and ...Bryan Rds. Owner builds. $40,000. CD 1/31 ...ENR 2/10.

Ind., Zionsville—PLANT—Pittman-Moore ..., 1200 Madison Ave., Indianapolis, two 2 ...story, wing addns., pharmaceutical mfg. ...plant, to Carl M. Geupel Constr. Co., 923 ...Chamber of Commerce Bldg., Indianapolis. $75,000. ...Irwington. Taggart & Fowler, 730 Indiana ...Pythian Bldg., Indianapolis, engrs. Awarded ...8/6.

Mass., Walpole—PLANT—F. Burton ...Mitchell, archt., Box 147, Foxboro, 1 story, ...brick, steel, plant addn., altering existing ...bldgs., for Ranger Corp., 2000 Main St., ...Frankini Constr. Co., 30 Mystic Ave., Med...ford. $60,000. Bids 8/15. CD 8/7—ENR 8/10.

Mich., Detroit—PLANT—Detroit Trans...mission Div., General Motors Corp., 5140 ...Joseph Campau St., brick, steel, rein.-con. experi...mental engine plant addn., to O. W. Burke ..., 1001 Fisher Bldg. Est. approx. $100,000.

Minn., Ada—PLANT, etc.—Land O'Lakes ...Creameries, Inc., L. L. Getten, production ...mgr., 2201 Kennedy St. N.E., Minneapolis, ...general contract 1 story, 96x128 ft. milk de...hydrating plant and warehouse, brick, glazed ...tile, to V. M. Jensen & Co., P. O. Box 68, ...Albert Lea, over $50,000. M. Buetow, 1931 ...University Ave., St. Paul, archt. CD 8/23—...ENR 8/31.

Minn., Rosean — PLANT — Land O'Lakes ...Creameries, Inc., L. L. Getten, production ...mgr., 2201 Kennedy St. N.E., Minneapolis, ...general contract 1 and 2 story, 95x150 ft. ...milk dehydrating plant, to J. B. Norfenstrom, ...Inc., $70,000. CD 8/16—ENR 8/30.

N. J., Bayonne—PLANT—Western Elec...tric Co., 300 Central Ave., Kearney, alter...ation plant, to Frank Briscoe Co., Inc., 287 ...Market St., Newark. Est. $40,000.

N. J., Carlstadt—PLANT—Columbia Pre...servatives Co., 631 Central Ave., plant addn., ...to C. A. Engineering Co., 485 Fort Lee Rd., ...Teaneck. $45,000. CD 8/7—ENR 8/9.

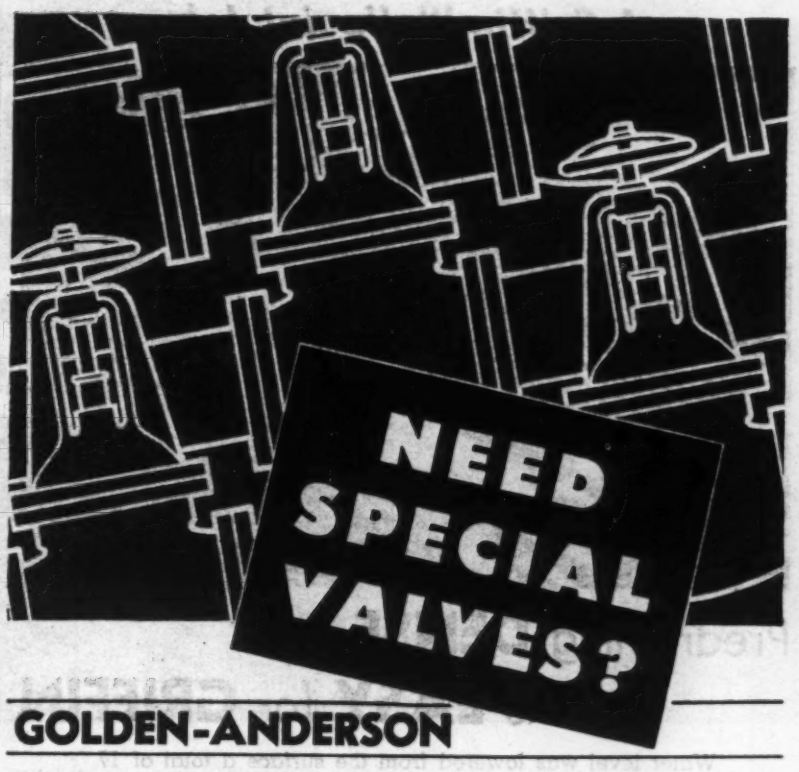
Pa., Pittsburgh—PLANT—Campbell Gen...eral Tire Co., T. Brown, NM, 3701 Bigelow ...Blvd., 1 story, 50 x 80 ft., brick, cement ...block tire recapping bldg., to Rose & Fisher ..., 2215 McClure Ave., N.S., Est. $40,000. ...F. McWilliams, 6300 Penn Ave., archt.

Tex., Lubbock—STORAGE BLDG., etc.—...Ferguson Auto Supply Co., Lubbock, 104 x ...8 ft., storage, shop and supply bldg., to ...J. Hair Constr. Co., Wichita Falls. $45,...000. Haynes & Strange, 415 Myrick Bldg., ...Wichita. CD 7/27—ENR 8/3.

Tex., Houston—WAREHOUSE—Consoli...dated Venetian Blind Co., 2401 Nicholson ..., masonry type warehouse, to J. O. Jones, ...1 Evans St. Approx. $41,000. CD 8/25—...ENR 8/31.

Tex., McAllen—FACTORY—R. B. Suttle, ...301 NW 16 St., 1 story clothing factory, ...brick, hollow tile, force account. $48,000. ...CD 8/16—ENR 8/24.

Tex., Mission—PLANT—L. Akin & Sons, ...Inc., 1 story citrus processing plant unit, ...brick, rein.-con. Owner builds. $40,000. CD ...8/17—ENR 8/30.



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. . . supplied in Single Acting, Double Acting and Electric types in standard, semi-throttling, stop-check, stop-starter unloading and relief design. Sizes from 2" to 36" to handle pressures from 150 to 400 lbs.

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INDUSTRIAL BUILDINGS (Contracts Awarded, Cont'd.)

Tex., Mission—PLANT—Mission Citrus Growers Union, Mission, 1 story citrus packing plant, rein.-con., brick, force account. Approx. $40,000. CD 8/23—ENR 8/31.

Tex., San Antonio—MACHINE SHOP—Acme Wire & Iron Wks., 1342 W. Laurel St., San Antonio, 1 story, structural frame concrete machine shop, force account. $40,000. CD 8/23—ENR 8/31.

UNCLASSIFIED

PROPOSED WORK

Calif., Newhall—AIRPORT—A. L. Novoteny, 1010 Sonora St., Glendale, airport on 400 acre site near Hy. 99 and Pico Canyon Rd. incl. exten. existing 2,200 ft. landing strips to 3,000 ft. and new 3,000 ft. strip, 2 hangars, office, over $150,000.

Kan., Stockton—PIPELINE CARRIER—Kansas-Nebraska Natural Gas Co., Inc., Phillipsburg, 16 mi. 12¾ in. pipeline carrier, removing approx. 16 mi. 7 in. line. $100,000.

O., Custer—SWITCH AND CROSSOVER REMOTE CONTOL—The Pennsylvania R. R., J. L. Gressitt, ch. engr., Pennsylvania Blvd., Phila., 4, Pa., switch and crossover remote control. $97,058.

Pa., Pittsburgh—RAILROAD FACILITIES—The Pennsylvania R.R., J. L. Greasitt, ch. engr., Pennsylvania Station, remote control from Monon Interlocking. $93,175.

Tex., Wharton—ELECTRIC LIGHTING SYSTEM—Town, outside electric lighting sys. for airport and areas. Over $25,000.

W. Va., Westville—TRACK EXTENSION—The Chesapeake & Ohio Ry. Co., C. Miller, ch. engr., 825 W. Main St., exten. West Fork Sub-Division and construct necessary mine tracks. $414,599.

BIDS ASKED

Alaska, Ketchikan—POWER DEVELOPMENT—Ketchikan Pub. Utilities, Ketchikan, Beaver Falls power development. $400,000. R. W. Johnson, Hoge Bldg., Seattle, Zone 4, Wash., engrs.

LOW BIDDERS

★ **B. C., North Vancouver**—DOCK, etc.—Dpt. Munitions & Supply, Ottawa, Ont., Aug. 14, Naval dock, dredging, erecting 2 main stores, administration bldg., inflammable stores structure, boiler house, garage and guard house, from B. C. Bridge & Dredging Co. Ltd., 540 Howe St., Vancouver. About $1,500,000. CD 8/2—ENR 8/10, under Vancouver.

Mass., Uxbridge — RECREATION IMPROVEMENTS—Town, R. H. Stinson, pres. Rotary Club, recreation imprvs., incl. concrete bathhouse, fireplaces, land work of leveling hill and filling swamp section, beach exten., etc., Pout Pond, to Joseph DeVries & Son, Main St. Est. $25,000.

O., Cleveland—STEAM LINE—Jones & Laughlin Steel Corp., 3341 Jennings Rd., installing 1,400 ft. 14 in. steam line from blast furnace boiler house to strip mill, to Schweizer-Dipple Co., 3161 E. 16 Pl., $158,000. G. R. Monks, c/o owner, engr.

†**Pennsylvania**—AIRPORT BLDGS.—U. S. Eng., Standard Oil Bldg., Baltimore, Md., airport bldgs., incl. hangar, boiler house, utilities, County Airport, Moon Twp., Allegheny Co., to Trimble Co., 1719 Penna. Ave. N.S., Pittsburgh. Est. $117,010. CD 7/5—ENR 7/13.

†**Tex., Abilene** — PARKING APRONS—U. S. Eng., Fort Sam Houston, addnl. parking aprons, to L. H. Lacy & Co., 3009 N. Henderson St., Dallas, $66,433. CD 8/11—ENR 8/17.

Tex., Andrews — PIPELINE CARRIER—Magnolia Pipe Line Co., Magnolia Bldg., Dallas, 5½ mi. 6 in. loop pipeline carrier, force account, $48,000. CD 8/23—ENR 8/31.

Tex., Houston—RAILWAY SPUR, etc.—City, railway spur, concrete, timber bridge, to Central Eng. & Constr. Co., 1317 Jefferson St., and Brown & Root, Inc., 4300 Calhoun Rd. $25,933. Bids 8/16. CD 8/9.

†**Tex., Midland**—SCORING TARGETS—U. S. Eng., Fort Sam Houston, sonic bomb scoring targets, to J. O. Boyd Constr. Co., P. O. Box 1343, Dallas. $28,626. Bids about 8/8. CD 8/1.

Tex., San Antonio—AIRPORT HANGAR, etc.—Hurt Airport, Culebra and Callahan Roads, 100x255 ft. airport hangar and shop, force account. Approx. $40,000. CD 7/7—ENR 7/13.

†**Va., St. Juliens Creek (br. Portsmouth)**—DOLPHINS—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., D. C., dolphins for mooring ammunition lighters, Naval Air Station, NOY 10230, to American Hydraulic Dredging Corp., 3904 Lee Hy., P. O. Box 146, Arlington, $37,300.

CONTRACTS AWARDED

★ †**Calif., Mather Field (br. Sacramento)**—RUNWAYS—U. S. Eng., 1209 3 St., Sacramento, Zone 3, exten. runways, aprons, taxiways, relocation of drainage ditch and night lighting sys., to A. Teichert & Son, Inc., P. O. Box 1113, Sacramento, $1,334,888. CD 8/29—ENR 8/31.

Proposal Advertisements see p. 231 & 240
Postwar Projects see p. 162

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